BOTANICAL MISCELLANY;

CONTAINING

FIGURES AND DESCRIPTIONS

OF

SUCH PLANTS AS RECOMMEND THEMSELVES BY THEIR

NOVELTY, RARITY, OR HISTORY,

OR BY

THE USES TO WHICH THEY ARE APPLIED IN

THE ARTS,

IN MEDICINE, AND IN DOMESTIC ŒCONOMY;

TOGETHER WITH

OCCASIONAL BOTANICAL NOTICES AND INFORMATION.

BY

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BIOGRAPHICAL NOTICE

OF THE LATE

CAPTAIN DUGALD CARMICHAEL, F. L. S.

By the Rev. Colin Smith, *Minister of Inverary.*

[It was, I think, in the spring of 1820, when at the house of the late Sir Joseph Banks, that my friend, Mr. Brown, spoke to me of a gentleman of considerable acquirements having arrived from the Island of Tristan d' Acunha, with an extensive collection of its vegetable productions. My love for Cryptogamic Plants led me to inquire if these had constituted a part of his collections and studies, to which Mr. Brown replied in the affirmative, and added, that he had left no branch of the natural history of the island unexplored; as was fully exemplified in the account of the island which afterwards appeared in the 12th volume of the Transactions of the Linnæan Society. This was the first time I heard of Capt. Carmichael, for it was of him that Mr. Brown spoke; and I had then no opportunity of making his acquaintance, as my professional duties required me to proceed to Scotland, where, however, I had soon the opportunity of obtaining a personal knowledge of the subject of this memoir. He had just retired from active life, having taken a farm at Appin, upon the romantic coast of Argyleshire; a spot well suited to the researches of a naturalist. Already, in the few months he had spent there, Capt. Carmichael had explored much of the country in the vicinity of his new residence, and he brought with him to Glasgow an interesting collection of the mosses of that district, with whose names and characters he soon made himself familiar. It was impossible not to be struck with the varied knowledge and information possessed by Capt. Carmichael; for though in botany he took the greatest delight, yet with almost every subject, and especially such as bore any relation to his extensive travels, his mind was richly stored. Distant and reserved at first, it was not till acquaintance had ripened into friendship, that his conversational powers were fully brought

forth. With such a man, then in the very prime of life, I had promised myself the pleasure of frequent intercourse, and a mutual interchange of ideas on our common and favourite pursuit. But his habitual antipathy to society, a rooted dislike to a crowded and commercial city, and, above all, his partiality to the scenes and occupations afforded by the situation of his little farm, rendered his visits to Glasgow much less frequent than I could have wished, and his stay among us was always of short duration. When he complained of the difficulty of getting access to books, in his retired place of abode, I have urged him to come and live in the neighbourhood of Glasgow; but his answer invariably was, "How should I live without the woods, and mountains, and deep dells which afford me Fungi; or the rocky beach that yields me such an infinite variety of amusement in the curious Algæ, among which I am daily discovering something new?" It was, indeed, in examining these minute productions of the Creator's hand that he spent almost the whole of his life after his retirement from active service. In pursuit of these, though his attention was wholly confined to the parish in which he lived, he was so eminently successful, that among the Fungi alone, he detected more species than had been before described as natives of the whole of Scotland. His specimens he preserved with the utmost care, gathering those Lichens which are the most firmly attached to the rocks and the stones, by a method peculiar to himself; and drawing and describing with the greatest accuracy, and with the constant aid of a powerful microscope when characterising the minute kinds, all such as were new or rare. Capt. Carmichael's correspondence was limited to a small circle. All his discoveries were communicated to me; and whatever could be useful to Dr. Greville's beautiful work on the Cryptogamiæ of Scotland, was liberally sent to that author. His personal acquaintance with botanists was nearly as circumscribed; yet the visits paid him by individuals of congenial tastes, were very gratifying, and he often spoke of the temporary residence of the Rev. J. M. Berkeley in his immediate neighbourhood, as a source of great pleasure to him.

My last interview with Capt. Carmichael was in the summer of 1826, when I invited him to join an excursion with the students of my class, which it was proposed should extend that year to Icolmkill, Staffa, and others of the more northern islands of the Hebrides. He met us in our vessel, immediately opposite his residence, when we proceeded to Mull, Skye, and thence, returning through the Sound of Mull, we visited Fort-William, Ben Nevis, and the majestic scenery of Glencoe. But it was easy to see that disease had made rapid progress in his constitution. His spirits were depressed, and his strength did not enable him to undergo any of the fatiguing ascents of the mountains; nor, at all times, to go ashore among the islands. But he brought a beautiful set of drawings of Confervæ, and other Algæ, and while showing and describing these to the more zealous botanists of our party, his powers of mind seemed to be as vigorous as ever, and the interest which the subject possessed for him, appeared almost to reanimate his drooping frame.

In the month of September, of the following year, I received the melancholy tidings of his death.

The botanical MSS., specimens, and drawings, have come into my possession, and in the publication of whatever is new amongst these, I hope to render some justice to the author in the forthcoming volume of the British Cryptogamiæ. It has, farther, been a wish nearest my heart, to lay before the public some account of the life and labours of this zealous and indefatigable naturalist. Yet, honoured as I was with his friendship, and the greater part of his correspondence, I felt that our personal interviews had not been sufficient to furnish me with the necessary materials for such a memoir. I had recourse then to my valued friend, the Rev. Colin Smith, Minister of Inverary, who, previous to his present residence, lived at Appin, in the immediate neighbourhood of Capt. Carmichael, had frequent and unreserved intercourse with him, and whose own acquirements and scientific research * rendered him

* Botany has engaged a portion of Mr. Smith's attention; and while writing, I am favoured by him with an interesting packet of plants from the woods and

amply qualified to narrate the circumstances of his friend's life. Mr. Smith readily entered into my views and wishes: he procured from Mr. Clarke, the brother-in-law, and several other relatives of our deceased friend, various documents, and original MSS., and journals, which they obligingly confided to his care; and notwithstanding the laborious duties of an extensive Highland parish, and much family affliction, Mr. Smith has furnished me with the following interesting sketch of the life and pursuits of Capt. Carmichael.—*W. J. H.*]

WHILE it is highly desirable that every country should have its just share of credit for the men of literature and science which it has produced, there is no individual, considered in himself, to whom the place of his birth has been less important in forming his character, than the naturalist, and with whom, therefore, it may be less necessary to record it. Not because his life reflects no honour on his natal soil, nor because he is himself insensible to the glow of patriotism; but because the sympathies of the naturalist extend beyond his own home, and Universal Nature claims his attention. Amidst the multitude of organised beings, the individuality of his own being is less to him than to others. His eye ranges from pole to pole, while his hand is stretched over mountain and valley, lake and wood, and the spot which has presented him with a new genus or a peculiar formation, becomes attractive to his thoughts as the dwelling-place of his fathers. His breath seems as if first drawn where he experienced the ecstacy that arises from the conviction of having discovered what had escaped the observation of others, and which stands hitherto recorded only in the annals of the Almighty in creation. The naturalist thus becomes the revealer, as it were, of a little world, wherein the Divine power and wisdom are displayed in new relations; and, while

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mountains near Inverary. Among other Muscological rarities, he has recently gathered there *Hypnum rufescens* and *Hypnum Crista-castrensis*, in fruit; *Gymnostomum lapponicum*, *Griffithianum* and *viridissimum*, *Weissia recurvata* and *trichodes*, and *Grimmia torquata*.

accustoming his eye to behold in every object a particular manifestation of infinite intelligence, he sees in each law the operating hand of the Almighty; in each being the life of the Eternal; in each climate His unity; in every distant planet His ubiquity; in every provision the fulness of His mercy; and in the constancy of their action His truth: while in the struggle to grasp the whole in his own finite comprehension, the naturalist possibly forgets or loses sight of self.

The Island of Lismore, in the county of Argyle, and one of the Hebrides, was the birth-place of Dugald Carmichael, in 1772. Born of parents who were in easy circumstances, he was early designed for a learned profession; and though the opportunities which the parochial school afforded might not perhaps be very great, nor calculated to enlarge the youthful mind, the eye of genius is ever open, and ready to avail itself of every advantage. While his schoolfellows were scattered over the play-ground, pursuing their own wild gambols, young Carmichael might be seen in some neighbouring field, gathering and examining the flowers which grew there, or searching in some fosse for the organic remains that were then plentifully scattered throughout the mosslands of Lismore. Thus do the amusements of the boy "cast their shadows before," and often exhibit an outline of the pursuits of the future man. He was regarded by other boys, generally, with contempt or astonishment; and had not his habits of silence and retirement been occasionally broken by indications of spirit, which checked the insolent and awed the timid, while he was characterised by uniform gentleness and a more than ordinary capacity for learning the prescribed lessons, his schoolfellows would not have failed to consider him a fool.

Nor was he satisfied with the mere observation of nature. He took peculiar pleasure in sketching, and with a love for colouring worthy of a Titian, he sought in nature for the means of imitating her own hues, and blended these in the best manner that he could. The inkstand afforded black, or when he wanted a different shade, he had recourse to the bark of the Alder; and the tops of the Heath yielded yellow.

Among other such zealous, though crude attempts, it is related by his sister, * that in order to procure red, he had recourse to his own blood, and when he had so mangled and drained his fingers by frequent puncturations that it became difficult or too painful to extract more from them, he endeavoured, by earnest entreaties, and such bribes as he could offer, to persuade her or some one of his companions, to suffer him to obtain a temporary supply from theirs.

This love of observation and experiment, which so far overcame bodily comfort, attended Mr. Carmichael through life, accompanied with an equally strong mental characteristic, that stamped him as an individual who listened principally to the voice of experience, and made *fact* the ground of all his reasonings. From a very early age it was remarked of him, that he only believed what he could see positive evidence for, so that the fireside stories of apparitions and goblins that are firmly credited in the Highlands of Scotland, and which caused the hair of the aged natives to stand on end, only excited his laughter. He had never witnessed these appearances, and seeing no use in them, he did not believe in their existence. But this incredulity was sometimes not comfortable to others; for, acquainted with the spots that were famed as the haunts of fairies and other præternatural visitants, he would slip out alone in the evening, and carrying his violin, of which he was very fond, under his arm, and concealing himself behind some tree or rock that was celebrated for ghostly appearances, he would there await the return of the servants from the fold, and alarm them with sounds, which, being unexpected, induced the belief that they proceeded from some unearthly inhabitant of the spot.

In 1787, Mr. Carmichael was sent by his parents to the University of Glasgow, to attend the literary classes, and he seems to have made a considerable proficiency in the Greek and Latin languages: but it is not surprising if the mysteries of metaphysical science should have but few charms for him,

* This anecdote was related to me by Mr. Clarke, near Oban, who has married the sister of Capt. Carmichael.

who looked to things more than to opinions; or that he should have turned his attention to medicine, as a study more congenial to his peculiar taste. What ardour he exhibited, or what progress he made during the years spent in attending these classes, cannot now be ascertained; but it is probable that he did not make any considerable acquisitions in science, in an University which at that time afforded few facilities and no stimulants to the student of nature. To a much later period, Glasgow was almost exclusively a school for logic and metaphysics; and those who are now enabled, in an attendance there, to benefit by the instructions of some of the first teachers of natural science that this age can boast, will hardly conceive the difficulties under which the student laboured, who, a few years ago, might have finished his curriculum without a master to inform him even of the authors whom it was necessary for him to consult.

How detrimental this was to the progress of general knowledge cannot be estimated; but though Mr. Carmichael went to Edinburgh to finish his studies, there is reason to believe that he deeply felt the disadvantage of not being earlier instructed in the first principles of natural science. Several years afterwards he writes,—" The plan adopted by several continental nations, particularly the French and the Swedish, of making natural history a branch of education in the public schools, possesses many advantages over the old Gothic system to which we still cling so pertinaciously on the English side of the channel. To those young men who are destined to pass a great portion of their lives in regions far removed from their native land, the study of natural history affords intervals of pleasing recreation from the fatigues of professional duty. This study, aided by a knowledge of a few of the modern languages, is the surest passport to the best society. It occupies those idle hours which would otherwise lie heavy on the hands of the young, or incite, perhaps, to dangerous irregularities. It affords exercise to the mind, and frequently adds to the sum of human knowledge. It has, also, over every other study, this peculiar advantage, that whithersoever fortune may direct our footsteps, materials

for it present themselves to our view. The pathless forest, the arid plain, the alpine rock, the desert island, tender by turns their varied and inexhaustible stores, and demand of us only exercise of body as the price at which they will furnish us with food for the mind. Even the boundless waste of ocean, which the common traveller views with an eye of apathy or apprehension, yields to the naturalist a rich harvest of amusement and instruction. A man possessed of a taste for natural history, has it in his power to amass a store of subjects, wherewith he can associate a train of agreeable recollections sufficient to afford him amusement during the remainder of his life; not to mention the pleasure he must feel in sharing his discoveries with those who have the same taste with himself, but who want the opportunity of indulging it.

"There is no denying that this branch of education may engender a host of unfledged philosophers, who will fancy, on their outset in life, that every thing must be new to others which appears so to themselves; and when such undertake to visit remote countries and communicate to the world the result of their observations, we must be prepared to meet with a little vanity and egotism, inflated language, extravagant theories, and deductions not always the most legitimate. With these drawbacks, however, the journal of a young traveller moderately skilled in natural history, will prove infinitely more interesting to the intelligent class of readers than that of a person who is totally ignorant of that branch of science."

After taking his diploma as surgeon, in the University of Edinburgh, Mr. Carmichael returned to reside with his father at Lismore, where, as may be imagined, he again applied to his favourite pursuits. But his circle of observation was limited, for this island does not abound in such productions as attract the eye of a young botanist. It is but little elevated above the level of the sea, and entirely formed of a blueish coloured limestone, more or less crystallized, which is occasionally traversed by veins of greenstone, and once only by a vein of pitchstone, scarcely an inch in thick-

ness, and exceedingly friable. The soil barely coats the rocks, which put forth their bald foreheads in every portion of the best cultivated fields, giving to this fertile island the appearance of a heap of stones, and rendering the spade as necessary an implement of husbandry as the plough. The plants found on it are not numerous, consisting chiefly of a few *Orchideæ*, *Primulaceæ*, *Saxifragæ*, *Cruciferæ*, &c.; and though the neighbouring mainland presents a greater variety of soil and elevation, we cannot believe that Mr. Carmichael would have made much progress in the knowledge of classification, far less have acquired his quick botanical eye, in a situation where he was excluded from the benefits to be obtained from books and sympathy, and where the list of native vegetables is by no means large. It is probable that his attention was at this time turned rather towards mineralogy, and that his sight was not indifferent to the majesty and beauty of the hills which form the great glen of Scotland, nor his mind inactive in speculating upon the manner of their formation. It was indeed a station calculated to arouse the slumbering spirit of the geologist into activity, and more callous observers than he who is the subject of this memoir might have their admiration excited by those mountains which inclose the island of Lismore as in a mighty amphitheatre, and which present so many and such varied aspects. It is believed that his knowledge of mineralogy was chiefly acquired at this time, while residing with his parents, after his return from the university.

In 1796, being appointed assistant-surgeon to the Argyleshire Fencibles, then stationed in Ireland, Mr. Carmichael had an opportunity of extending his knowledge of the workings of nature. Yet he has not left behind him anything which enables us to trace what progress he there made in science. When the advantages of scientific instruction are wanting in youth, years of after labour become necessary for the student, during which we may find him labouring assiduously to compass the first elements of knowledge, and carefully treading the paths which others have trodden before him, in order to ascertain what has been already done, and what yet

remains to be effected. For nine years, during which he was stationed in Ireland, Mr. Carmichael seems to have been preparing his mind for future discoveries, and by a fortunate coincidence, Robert Brown, Esq., who has justly been called "the first botanist of this or any other age," held a similar appointment upon the same station. That the advantages arising from this circumstance were improved by Mr. Carmichael, can hardly be doubted; and an intimacy was then formed between him and the great British botanist, which was renewed in after life, when each had risen to eminence in his respective line.

Whatever pleasure he may have received from society such as this, his eye could only rest upon objects that others had discovered long before, and so long as foreign lands lay untrodden and unexplored, Mr. Carmichael could not but have a longing desire to visit them. He therefore gladly embraced the opportunity of entering the 72d regiment, in hopes of being sent to some foreign station; and whether it was that he deemed it most conducive to his interests to drop his profession as a surgeon, or, as is more probable, that he found his duties interfere too much with his favourite pursuits, he exchanged the lancet for the sword, and entered the 72d regiment as Ensign. In 1805, his wishes were fully accomplished; the corps to which he belonged being one of those which formed the expedition under Sir David Baird, against the Cape of Good Hope; and from this period he carefully noted whatever occurred to him that was deserving of remark, keeping a diary, in which, from time to time, he entered such observations on men, opinions, climate, plants, &c. as might be instructive to others, or amusing to himself. He was engaged in the action with the enemy which took place on landing at the Cape, and from the account which he gives of it, as well as from his general description of military movements and stations, we learn that he made his new profession his study, and that he was not contented merely with being an officer, but brought his talents to bear on his occupations, until he knew the general duties which he might have to perform, as well as the general rules of the

military art. Colonel Grant, who then commanded the 72d, seemed to have duly estimated his merits, and desired his promotion; but having been wounded in this engagement at the Cape, Carmichael lost, in consequence, an active friend. He always spoke of his profession with the warmth of a soldier, and of his brother officers with fondness; a fact, indeed, which also proves that his own deportment was such as commanded their regard.

Of this brave action which terminated so favourably for the British arms, we shall give the description in Capt. Carmichael's own words.

" The expedition under the command of Sir David Baird, which was destined to act against the Cape of Good Hope, consisted of the 24th, 38th, and 83d regiments, commanded by Brigadier-General Beresford; and the 71st, 72d, and 93d, commanded by Brigadier-General Ferguson; three companies of the Royal Artillery under General Yorke; and two squadrons of the 20th Light Dragoons. To this force must be added the 59th regiment, embarked for the East Indies, which was ordered to co-operate with us in the reduction of the Cape. The naval force, commanded by Sir Home Popham, consisted of two 64 gun-ships, and one of 50 guns; two frigates, a sloop of war, and two gun-brigs.

" The expedition sailed from the Cove of Cork on the 2d day of September, 1805, and on the 4th of October, the fleet, amounting to about seventy sail, came to anchor in Funchal Roads, off the Island of Madeira. We weighed anchor again, and directed our course for St. Salvador, on the Coast of Brazil, where we arrived on the 12th of November, with the loss of the Britannia Indiaman, and the King George transport, with General Yorke on board, which were wrecked on the shoal called the Racers, off Cape St. Augustine. Leaving St. Salvador on the 26th of November, we made the Cape of Good Hope on the 3d of January, 1806; and on the evening of the 4th, the whole fleet came to an anchor in the channel, between Robin Island and the Blueberg.

" Early on the morning of the 5th of January, General

Beresford's brigade made an attempt to land; but on approaching the shore, the sea was found to break with such violence, that it was thought prudent to desist. As that part of the coast was known to be subject to a heavy surge, and the situation of the fleet was such as forbade any unnecessary delays, the Diomede, with the transports carrying the 38th regiment and General Beresford, was despatched to Saldanha Bay, and the whole fleet would have followed next day, had not the Highland brigade been fortunate enough to effect a landing about six miles farther to the Southward, in Sospiras Bay. The enemy's riflemen appeared lurking among the bushes, and showed a disposition to annoy us; but they were speedily dislodged by a few shots from the gun brigs that covered our approach. The only serious accident that occurred was the loss of one of our boats, having on board about forty men of the 93d regiment, which was overset on a bank of shore-weed, and every soul lost.

" The 7th of January was employed in disembarking the remainder of the troops and the field artillery. Five hundred volunteers from the ships of war and Indiamen were also landed, for the purpose of dragging the guns, a service which they performed with their accustomed enthusiasm. At four o'clock, on the morning of the 8th, we moved from the sand hills along the road that leads over the shoulder of the Blueberg. When we arrived on the crest of the hill, we perceived the enemy drawn up on the other side. Our disposition was soon made. We were formed in echellons of brigades; the left, or Highland brigade, being about two hundred yards in advance of the other. In this relative position we advanced, sometimes in line, at others in file from the heads of companies, according to the nature of the ground. We no sooner arrived within range of the enemy's artillery, than he opened his fire on us from twenty field-pieces, which were advanced considerably in front of his line.* The

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* Capt. Carmichael's account of this action is that of a soldier: a peaceful missionary, the Rev. Henry Martyn, who witnessed it from the fleet, thus notices it in his interesting Journal:—

action, on our side, was begun by the grenadiers of the 24th regiment, sent to dislodge a body of mounted riflemen, which occupied a rising ground on our right flank. This duty the grenadiers performed with great intrepidity, but not without serious loss: Capt. Foster * being killed on the spot, and fifteen men either killed or wounded.

"The line, in the meantime, continued to advance over a tract of ground where we were buried up to the middle in heath and prickly shrubs. Owing to some misconception of orders, we began firing before we had arrived within killing distance of the enemy; but this error was speedily corrected by the rapidity of our movement, which alarmed him so much, that, by the time we came within a hundred yards of his position, he began to retreat. This he effected in very good order; for, to tell the truth, we were in no condition to molest him. Fresh from the cool bracing climate of Ireland, then cooped up for five months on board of crowded transports, a march of six hours over the scorching sands of Africa, exhausted us to such a degree, that even the exhilarating sight of a flying enemy could not prevent immense numbers from escaping to the rear.

"Our force of every description in this action, was about five thousand men; that of the enemy three thousand. The loss was nearly equal, being about three hundred in killed

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"The Indiamen being then ordered to get under weigh, and the men-of-war drawn up close to the shore, a landing was effected, and soon after seven the next day, a most tremendous fire of artillery began behind a mountain abreast of the ships. It seemed as if the mountain itself was torn by intestine convulsions. The smoke arose from a lesser eminence on the right side of the hill; and on the top of it troops were seen, marching down the farther declivity. Then came such a long-drawn fire of musketry, that I could not conceive any thing like it. We all shuddered at considering what a multitude of souls must be passing into eternity. The poor ladies were in a dreadful condition: every shot seemed to go through their hearts. The sound is now retiring, and the enemy are seen retreating along the low ground on the right, towards the town."

* "Among several others, some wounded and some dead, was Capt. Foster, who was shot by a rifleman. We all stopped for a while to gaze in pensive silence on his pale body."—*Henry Martyn's Journal.*

and wounded. After the engagement, we advanced as far as Reitt Valley, where we received from the fleet a supply of provisions and water. Next morning we marched on towards Cape Town, and had approached within a few miles of it, when we were met by a flag of truce demanding a cessation of hostilities for forty-eight hours, in order to arrange terms of capitulation. Sir David Baird returned for answer that they should have six hours only, and that, if the place was not surrendered at the expiration of that period, he would enter it by storm in the course of the night. This menace had the desired effect, and the 59th regiment marched in that evening and took possession of the lines. The rest of the troops lay on their arms, at the mouth of the Salt River, until three o'clock, P. M. next day, at which hour the British flag was hoisted on the castle, a royal salute was fired by the ships of war, and the Highland brigade marched to Wynberg.

"We thus, without much difficulty, got possession of the capital; but Jansen was still unsubdued. After the action at Blueberg, he had retired with his whole force to the pass of Hottentot's Holland Kloof, where he designed to establish himself in such a manner as should cut off the communication of Cape Town with the interior. With a view to dislodge him from this stronghold, the Highland brigade and 59th regiment marched on the 12th to Stettenbock, and were followed, in a few days, by Sir David Baird in person. After some preliminary overtures between the two Generals, a negociation was set on foot which terminated in the formal cession of the whole colony to the British arms.

"While the transaction was pending, however, and with a view to accelerate its progress, the 59th and 72d regiments were detached up the country, to occupy a position in rear of the Dutch troops. We marched from the encampment at Stettenbock about eight o'clock in the evening of the 16th January, and arrived early next morning at the Paarl. This charming little village consists of a single street, nearly a mile in length. The houses are built at some distance asunder, neatly white-washed, with an elevated terrace along

the front, and a row of trees to shade them from the street. Behind each dwelling, there is a small kitchen garden and vineyard, which ascend against the side of a pretty high hill, that shelters the village from the westerly winds.

"Notwithstanding the fatigue of a nocturnal march, curiosity prompted me to walk up to the top of this hill, to which the colonists, struck with some peculiarity in its appearance, have given the name of Paarlberg. The summit is of granite, worn into a hemisphærical form, and furrowed here and there by deep fissures, through which the atmospherical moisture, condensed from the clouds, gushes down in perpetual rills. The sides of the fissures are garnished with those fleshy plants, so abundant in South Africa, the *Crassulæ*, the *Cotyledons*, and the *Aloes*. On the top of this granitic cupola, a number of detached masses of the same material lie scattered about, some of them apparently so nicely poised, that a slight push might roll them down upon the village.

"On our arrival at the Paarl, we found the people prodigiously civil. Every door was thrown open for our reception, and several of the inhabitants carried their kindness so far as to send even to the parade to invite us to their houses. Some of our speculators ascribed this marked hospitality to fear; while others, inclined to judge more favourably of human nature, imputed it to general benevolence of disposition. Those who suspended their opinion on the subject, had the laugh at the expense of both, when, on our departure next morning, the true motive was discovered in the amount of their bills.

"We marched on the 18th to Waggonmaker's Valley; and in the course of the day, had occasion, more than once, to cross the Great Berg River. In the summer season, this river is nothing but a series of deep pools, called the Sea-Cow Holes, connected by a trifling stream; but in winter its depth and rapidity are such as to intercept the communications between Cape Town and the interior for weeks at a time. The sea-cow, (*Hippopotamus amphibius,*) formerly so abundant in all the large rivers, is now totally extirpated, or banished beyond the limits of the colony, with the exception

of a few individuals which still harbour in this stream, under the protection of a direct law. We had not long halted at Waggonmaker's Valley, when an express from head-quarters overtook us, announcing the surrender of the colony, and directing Colonel Gibbs to return with his regiment to Cape Town, while we were ordered to continue our route to Tulbagh. With this view, we marched on the 19th to Eykeboom; and on the 20th arrived at the end of our journey.

"Within four miles of Tulbagh, we had to pass through a narrow tortuous defile, called Roodsand Kloof. The correspondence between the sides and angles of this intricate pass, suggests the idea that it was originally formed by the violent disruption of the mountain mass which it traverses. The precipice, on both sides, is clothed with shrubs, and animated by flocks of large baboons, and the Little Berg River is seen forcing its way among the rocky fragments accumulated at the bottom of the chasm.

"The village of Tulbagh, the only one in the district of that name, consists of about thirty houses, disposed along one side of a street, through which a stream of water has been conducted, for the purpose of irrigating an equal number of gardens that occupy the other side. It stands near the northern extremity of a valley, twenty miles long, and five or six miles in breadth, inclosed within deep mountainous ridges. This valley is a sort of table-land, being elevated three or four hundred feet above the level of the country, toward the coast. Owing to this elevation, it enjoys a milder temperature, and the constant supply of water from the mountain streams renders it more fertile than most parts of the colony. The landrost, or chief magistrate, resides near Tulbagh, and the court of Hemraaden meets there to discuss the affairs of the district. A small neat church adorns one end of the village, and the parsonage stands unrivalled at the other.

"The avowed object of our expedition to this remote place, was to administer the oath of allegiance to the landrost and leading men of the district, and, at the same time, to impress on the minds of the boors an exalted idea of the

British power. This being accomplished to the satisfaction of our commanding officer, the regiment was again put in motion, and we returned by our old route to Stellenbosch. This village is the largest in the colony, and pleasantly situated on the Eerste River. It is sheltered on the east side by the lofty mountains of Drakenstein, the summits of which are, in winter, covered with snow. Stellenbosch is the Montpellier of the Cape, to which invalids of all descriptions, resident in Capetown, retire during summer, from the wind, the dust, and the heat of that boisterous, broiling capital. The surrounding country is rich and well watered. Its chief produce is the grape, from which a large quantity of wine is annually prepared for the market.

"Just as we had got clear of Stellenbosch, on our march to Capetown, brimful of the wonders we had seen, we were met by an orderly dragoon, with a dispatch, directing us to take the route to Simonstown. This we thought a very serious hardship, and a sorry return for our recent services: but there was no alternative.

"Half way between Wynberg and Simonstown, lies Muysenberg; where we found barracks for the accommodation of three companies, which we left there. The road from the latter place was along a cold rocky shore, on which a heavy surge perpetually rolls. On the other side, a steep rugged mountain rises abruptly from the shore, leaving hardly room for the narrow path which winds along its base. From the nature of the ground, a succession of obstacles can be thrown in the way of an army landed at Simonstown, and advancing towards Capetown along this pass. On this account, Muysenberg, the outlet of the defile, has been styled the Thermopylæ of Southern Africa; and so far it no doubt merits the appellation, that a small body of troops could check the progress of a large army advancing along the shore: but, like its celebrated prototype, it fails in a most essential point; for it can be easily turned; and not only turned, but commanded by several paths through the mountain behind it. It is equally untenable in another point of view; a single ship of war, bearing her broadside on it, could knock the whole

barrier in a few minutes about the ears of its defenders. The battery consists of four eighteen-pounders, pointed to the sea, and an equal number bearing on the defile. The works are constructed of loose round pebbles, picked up on the beach, surmounted by an earthen parapet, and the whole is so frail that a single shot would demolish it from top to bottom.

"While describing the nature of this pass, I cannot help adverting to a volume of Travels which fell into my hands at the period in question. It is the production of a Mr. Perceval, and was written at the time the colony was in possession of the British during the late war. This gentleman landed at Simonstown, and, having passed by Muysenberg on his way to Capetown, takes occasion to detail its natural productions in the following words:—

"'The eye now meets with a different prospect, and full scope is afforded for the Botanist to gratify his favourite propensity. At the foot of the hills, which are close to your left hand, a great variety of African evergreen plants present themselves amongst a profusion of other shrubs and flowers. Those which attract the attention, chiefly, are the *Red pepper tree*, the *Castor-oil shrub*, the *Silver-tree* (*Protea argentea*), *Myrtles*, several feet high, *Laurels*, and *Laurustinus* in abundance, *Arbutus*, *Jessamines*, *Geraniums*, *Sunflowers*, *Blood-flowers*, *Coffee plant*, *Napal or prickly Pear*, *Asparagus*, *Mulberry*, and many others peculiar to this spot of the world.'

"Had Mr. Perceval omitted this precious list of evergreens, and selected his catalogue from amongst the 'many others' to which he alludes, he might perhaps have saved his credit as a Botanist. But, as the matter stands, he appears merely to have opened the Gardeners' Kalendar, and transcribed the first names he happened to cast his eyes on. To form a proper estimate of the fidelity of his enumeration, it is necessary only to mention, that the spot in question, which, according to his account, ought to be consecrated to Flora, is not only in a state of nature, but absolutely incapable of being improved by art. I may venture, indeed, to pronounce, that there is not, in all Southern Africa, barren as it is, a more barren or untoward spot than the Pass of Muysenberg. It

was my lot to be stationed there for six weeks; and, as Botany was my chief amusement, I had an opportunity of forming a pretty correct idea of its natural productions, especially of the perennial kind. Not a day elapsed during which I did not walk over several miles of its vicinity in search of plants; yet, in all my rambles, I never could discover an individual of those he has named, with the exception of a few obscure *Geraniums* and *Asparagus* plants, which were not very likely to arrest the attention of a common traveller. It is true that most of those plants are to be met with as objects of use or curiosity in gardens; but the only individuals of them that are natives of the country, are the *Protea*, the *Geranium*, (or rather *Pelargonium*,) the *Hæmanthus*, or *Bloodflower*, and the wild *Asparagus*.

"That man must always travel pleasantly who possesses the happy art of strewing his path with flowers. Mr. Perceval seems to have been enviably gifted with this faculty. Where-ever he turns, nature, or his prolific pen, scatters around him the rarest productions of the vegetable world. Of him might truly be said what Hudibras says of his mistress—

> 'Where'er you tread, your foot shall set
> The primrose and the violet.'

"Describing the gardens of the colonists as he passed along, he says that '*Myrtles*, *Laurels*, *Laurustinus*, *Geraniums*, *Jessamines*, *Albucas*, and *Hyacinths* form part of their fences, growing spontaneously in most places.' *Myrtle* hedges are indeed very common, and grow to a much greater height than he seems to have been aware of; but with respect to *Laurels* and *Laurustinus*, I believe they are very rare at the Cape, and the *Geraniums*, *Albucas*, and *Hyacinths* have degenerated so much since Mr. Perceval's time, that they would, at this day, make but a sorry fence indeed.

"Mr. Perceval seems to have been fortune's favourite in his sporting as well as his botanical excursions. *Springboks* and *Lorys* start up, or fly overhead, at every turn. Yet is it notorious that the *Springbok* has rarely been known to

approach within thirty leagues of Capetown; and the *Lory* is an inhabitant of the deep forests only, which are still more remote from the scene of his sporting exploits.

" The village of Simonstown derives all its consequence from the excellence of its harbour, in which, during six months of the year, the largest fleet can ride in safety. Its local situation is such as will ever prevent it from acquiring any size or importance as a town. The country rises abruptly from the shore into a high rugged table-land that sets cultivation at defiance, while the distant and circuitous communication with Capetown is such an obstacle to the transport of heavy goods overland, that the shipmasters prefer risking the dangers of Table Bay that they may arrive the more cheaply and speedily at their market.

" The anchorage is defended by two permanent batteries, on each of which are mounted six eighteen-pounders. In addition to this, several temporary defences were thrown up by us, while our ideas were yet in a state of confusion, and when, not knowing our weak points, we judged it expedient not to leave any part unguarded. Thus every projecting hillock round the bay, was crowned with batteries hastily constructed of fascines, sand-bags, or biscuit-barrels. In the midst of the confusion and hurry of that busy period, the French frigate, La Cannonière, made her appearance in Simon's Bay. Uncertain whether the colony was Dutch or British, she cruised about for two days to pick up intelligence. During the whole of this time, we had the batteries manned, the furnaces heating shot, and the troops paraded for action. The critical moment at length arrived: the frigate dropped anchor, and, lowering one of her boats, despatched it with an officer and seven seamen to the landing-place. There were in the harbour about a dozen transports and merchant vessels, each of which had a boat ready manned, and forty grenadiers were placed in ambuscade, in a coasting schooner belonging to the town baker. The enemy no sooner entered this magic circle, than the whole closed round to cut off his retreat. The officer, comprehending at once the nature of his situation, resigned himself to his fate without a struggle;

and observing a naval officer among the crowd, tendered his sword to him, which the other was in the act of returning, when Major —— galloped down the jetty, and was announced to Monsieur as the commandant of Simonstown. As such, the captain a second time surrendered to him his weapon, which he had no sooner grasped, than he countermarched his steed, and rode off with the glorious prize. A few red-hot shot fired at the frigate, made her cut her cable and put back to sea."

The regiment being ordered to Capetown, Captain Carmichael has time to describe its remarkable features.

"Capetown is built in a valley, surrounded on three sides by mountains, the most conspicuous of which, the Table Mountain, rises behind it like an immense wall, supported by buttresses. On the right hand, the Devil's Hill is almost as high and precipitous: but the Lion's Hill on the left, swells up to a more moderate height, with a smooth unbroken surface. The front is occupied by the Table Bay, beyond which you have a distinct view of the Blue Berg, and the mountains of Drakenstein.

"The plan of Capetown is quite regular. The streets are perfectly straight, and intersect each other at right angles. They are laid with a sort of coarse gravel, cemented by a red ferruginous clay, which being soaked with water, and well rammed, acquires an almost stony hardness. A small stream which runs through the town, is confined on either side by a wall, and it can be checked at pleasure by a series of locks, placed at certain intervals, which give it the appearance of a canal.

"The houses are built in general of bricks, bedded in loam, but so imperfectly burnt, that they absorb the rain, and would soon crumble away, if the walls were not secured by a thick coating of plaster. In the front of each house is a platform, called a stoop, from four to six feet broad, and furnished at each end with a seat. These stoops are a great annoyance to the public, occupying an unreasonable proportion of the large streets, and reducing the smaller ones to mere lanes. The surbase of the walls towards the street, is

always painted in pannels, in imitation of variegated marble. The roofs are flat, and rendered impervious to the rain by a thick layer of mortar. The ground-floors are paved with glazed tiles, which preserve a refreshing coolness in the apartments; but in constructing the stairs, even of the best houses, the model seems to have been the companion-ladder of an Indiaman, they are so steep, so narrow, and badly lighted. Over every house door, there is a half window, in the centre of which is fixed a glass lantern, projecting outwards. These lanterns, furnished with a candle or lamp at night, light the halls within, and serve, at the same time, as a good and cheap substitute for street lamps. The windows are extremely large; but the upper sash is usually blind, being covered with painted wood or canvas. The houses themselves are larger and more showy than the opulence of the citizens can well warrant: but it is seldom that more than the ground floor is furnished, the upper part being used as a store, or let occasionally to lodgers.

"Rows of trees are planted in some of the streets, to soften the glare from the white walls; but as the planting of them is left to the caprice of individuals, the shade they afford is quite partial. These trees, consisting in general of oak and pine, never grow higher than the tops of the houses, their branches being blasted and withered by the south-east wind as soon as they shoot beyond the shelter of the walls.

"The great barrack is built at the upper extremity of a plain which extends as far as the shore, and is intersected by the principal road that leads into the town. The lower division of this plain is walled in and surrounded with a ditch, and the area, covered with gravel, forms the grand parade.

"The barrack was built by the Dutch East India Company as an hospital for soldiers and sailors. Before the discovery of the mode of preserving health during long sea voyages, those undertaken to India were never accomplished without an alarming loss of lives. It was found necessary, on this account, to establish an hospital at the Cape for the reception of such as were disabled by sickness from prosecuting the voyage, where they were left until the arrival of

the next fleet, which took them up and replaced them with others in the same state. The upper floor of this building could accommodate two thousand sick; and the ground floor served as a magazine of wine and provisions for the fleets. As both floors are now occupied by troops, it affords ample accommodation for three thousand men.

"There are two squares in Capetown. That which is termed the Market Square is in the centre of the town, and is occupied during the day as a fruit-market. The Boeren Plein, or Hottentot Square, is situated in the upper part of the town, and is appropriated to the use of the farmers, who resort thither with their waggons. It is surrounded with houses for the reception of these people, who dispose of their country produce to the landlords in exchange for such goods as they have occasion to purchase. In this barter, the advantage is said to be greatly in favour of the citizens, who are accused of imposing grossly on the simplicity of their country customers.

"The government garden is surrounded by a wall, built at the time Sir George Younge was governor of the Cape, and which is said to have cost the public ten thousand pounds. The enclosure consists of forty acres of land, and is divided into about half as many compartments, by walks or alleys, which, after the Dutch fashion, cross each other at right angles. The principal walk, running along the centre of the garden, is covered with gravel, and shaded with two rows of oak trees. Along each side of it, there is a small stream of water, bordered by a hedge of broad-leaved myrtle.

"There is a particular division, allotted for a Botanical Garden; but since our arrival no steps have been taken to keep it in order, or to enrich it with the rarer productions of the African Continent. Sir David Baird loved drill better than he loved Botany; and his present Excellency, in so far as his affections have yet developed themselves, seems to love his money better than either. It is beyond a doubt, at least, that the best cultivated portions of the garden are those which yield vegetables for his table, or provender for his cattle. At the upper end of the garden there is a menagerie,

where the naturalist may gratify his scientific curiosity with the sight of a couple of lions, a wild ass, an ostrich, and two or three flamingoes.

"The Table Valley is watered by a variety of streamlets, which descend from the mountains, and are turned in all directions, to irrigate the numerous gardens and vineyards which adorn their banks. Neat and commodious houses, embosomed among *Oak*, *Pine*, and *Silver-trees*, and rising in successive stages behind each other, render the back ground of Capetown uncommonly picturesque; while the stupendous outline of the Table Mountain, impending over it, gives to the whole scene an imposing air of grandeur, which few landscapes can boast.

"The face of the Table Mountain has been compared to the ruins of a fortification. From the bay, it has the appearance of two enormous bastions, supported by buttresses, flanking an intermediate curtain. The upper region of the mountain, about fifteen hundred feet in perpendicular height, comprehending the mural precipice, consists of sandstone, arranged in horizontal strata, and reposing on a base of granite. Over the broken edges of these strata, the water, condensed from the atmosphere, is continually distilling in large drops, which reflect the rays of the sun in all the colours of the rainbow. In some parts it escapes in a continued stream, and affords a most refreshing draught to those adventurers whom curiosity prompts to explore the "cloud-capped summit" of the Tableland.

"From the bottom of the precipice to the depth of five or six hundred feet, the mountain consists of granite, the surface laid bare, along the channel of one of the mountain streams. Here it abuts against the vertically stratified clayslate, which forms the base of the mountain, and of the valley beyond. At the point of junction, numerous veins, ramifying in a thousand ways, pass from the body of the granite into the schist, and both of them are traversed by large veins of *Basalt*.

"Along the line that joins the Curtain to the West Bastion, there runs a deep chasm, through which is the only path to the top of the mountain on the side of Capetown. From the

moment you enter this chasm, it gradually narrows as you ascend, while its perpendicular walls, crossed by innumerable rifts, seem as if they were built of loose cubical masses, that threaten to fall down and crush you to atoms. The immense height and dismal line of the rocks, the twilight gloom, and the whistling of the wind, brushing along the cliffs, create a disagreeable impression on the mind. But this impression passes quickly away as the horizon begins to expand above; and when the summit is gained, you feel the delightful contrast of the cool invigorating elasticity of the air, and the boundless view that opens around you.

"The flat top of the mountain, called the Tableland, is about two miles in length, from east to west, and of various breadth, but no where exceeding a mile. The height of the mountain, above the level of the sea, is estimated at three thousand five hundred feet. A constant verdure is maintained on it, by the moisture deposited from the atmosphere. When I ascended in the month of November, I started eight coveys of *Partridges*. It is probable that these birds migrate hither in the summer season on account of the coolness and greater abundance of water.

"It is a common saying among the inhabitants of Capetown, that when the Devil spreads his table-cloth on the mountain, you may look for a strong south-east wind. In the whole system of meteorology, there is not a more infallible prognostic. The Devil's table-cloth is a thin sheet of white vapour, which is seen rushing over the edge of the precipice, while the sky all around is serene and unclouded. The rapidity of its descent resembles that of water pouring over the face of a rock. The air, at the same time, begins to be agitated in the valley; and, in less than half an hour, the whole town is involved in dust and darkness. Instantly the streets are deserted, every door and window is shut up, and Capetown is as still as if it were visited by the plague.

"Sometimes, however, instead of a sheet of vapour, an immense cloud envelops the mountain, and stretching out on all sides, like a magnificent canopy, shades the town and the adjacent country from the sun. The inferior boundary of this

cloud is regulated probably by various circumstances; among others, by the strength of the wind and the temperature of the air in the Table Valley. The influence of the latter is to be inferred from the fact, that though the cloud never descends farther than half way into the hot parched amphitheatre of Capetown, you may observe it on the side of Camp's Bay rolling down in immense volumes to the very sea, over which it sometimes stretches farther than the eye can follow it.

"I do not know any thing more singular than the aspect of this cloud. It is continually rushing down to a certain point on the side of the mountain, and there vanishing. Fleeces are seen, from time to time, torn from its skirts by the strength of the wind, floating and whirling, as it were, in a vortex over the town, and then gradually dissolving away. But the main body remains, as if nailed to the mountain, and bids defiance to the utmost efforts of the gale.

"Numerous batteries have been erected for the defence of Capetown and its anchorage from hostile attacks. The distance along the shore, from the mouth of the Salt River to the extremity of Green Point, is about three miles, the town standing in the centre; and a line, drawn between these two points, would include the principal part of the anchoring ground.

"The mouth of the Salt River is protected by Craig's Battery, with six eighteen-pounders, mounted *en barbette*. Six hundred yards nearer the town, stands Fort-Knocke, a strong well-finished star redoubt, surrounded by a palisaded ditch, with a few pieces of heavy cannon, chiefly for the purpose of scouring the beach. This is the point from which the lines take their departure. The land-lines extend about half a mile up the acclivity of the Devil's Hill, and, on their way, connect three square redoubts, from which a cross fire can be maintained with Fort-Knocke. But the chief annoyance to an enemy approaching by land, would be from three blockhouses and a redoubt, erected high up on the face of the hill, which support each other, and overlook every avenue to the lines. The sea-lines sweep along the strand, as far as the castle, a distance of five or seven hundred yards.

They are strengthened by four batteries, on each of which is mounted from five to ten pieces of heavy ordnance. But the whole are in very bad order. The buttresses, undermined by the surge, have yielded to the weight of the platform; and the parapet is choked up on both sides by the shifting sand.

"The castle is a regular pentagon, consisting of five bastions, connected by curtains, and surrounded by a *fausse bray* and dry ditch. On these bastions there were originally mounted not fewer than seventy pieces of cannon. This formidable train are now dropping off their carriages, and the mouldering parapet resuming its ancient position in the ditch. On the outside of the castle ditch, and close to the landing place, stands Imhoff Battery, which has been thoroughly repaired, and mounts forty pieces of cannon, besides several heavy mortars. There are lodgings in the castle for the commander of the forces, and the commandant; besides barracks for a regiment of infantry, and a variety of offices for the civil and military department.

"The battery of Roggebay, four hundred yards from Imhoff, is nearly on a level with the sea, and carries twenty pieces of cannon, of various calibre. As you advance along the shore, you arrive successively at the Amsterdam Battery, the Chiffone, and the Great Mouillié; and, on a small eminence at some distance from the shore, you see the battery called *Keek in the Pot.* All these batteries, with the exception of the Amsterdam, are mere *flèches*, without any defence on the land side. The latter had originally a second tier of guns; but the casemates are now occupied by prisoners of war, and by the malefactors condemned to public labour. Though this battery is secured by a rampart in the rear, it could be easily taken by a *coup de main*, owing to a vice in its construction on that side, to which there is probably no parallel in the whole annals of fortification. The rampart consists of a revelment of five feet high; and a sloping turf parapet, of an equal height, leaves on the edge of it a *berme*, sufficiently broad to afford a firm footing to the assailants. There is, on the inside of the rampart, a wall which rises six feet above the *terrepleine*, and, at the height of four feet, is

pierced with loop-holes. If the engineer who superintended the erection of this battery meant these loop-holes for the service of its defenders, he strangely mistook his object, as they are fully seven feet above the internal area of the works, and an enemy, once in possession of the rampart could destroy every man in the battery, by firing through the loop-holes, without running the smallest risk themselves.

" The first thing which arrests the attention of a stranger, on his arrival at Capetown, is the wonderful diversity in the features, colour, and costume of the various descriptions of people who crowd the streets. He feels amazed at finding himself in a sort of Noah's Ark, where he meets with more varieties of one species than the Patriarch had under his charge of the whole animal creation. Here he may see the pure spotless robe of the Hindoo rubbing against the painted kaross of the Caffre and the soot-stained sheepskin of the Hottentot: here the barefooted boor from the snow mountain stares at the polished boots of the London cockney: here he may contrast the crop of the Pennsylvanian with the pendent crown-lock of the Chinese: here the Brazilian may shake hands with the Malay, and the Guinea Negro with his brother from Madagascar. In the midst of this motley groupe, Europæans of every description, either as traders or prisoners of war, pass in review before him. The geographical position of the colony will account, in some measure, for the concurrence of these heterogeneous elements of population. The peculiar circumstances under which it was originally established, facilitate the emigration of people from all parts of Germany and the North of Europe. The revocation of the Edict of Nantz drove numbers of French Protestant families here for refuge; the practice of discharging soldiers in the settlement, after a certain period of service, few of whom ever returned to Europe; the extensive communication between Europe and India, in the course of which numberless adventurers were induced by hope, or forced by distress, to relinquish their prospects in the East, and settle in the colony; and, finally, the salubrity of the climate, inviting the martyrs to tropical diseases to repair

hither for the re-establishment of their health: such are the lights of the picture; the shades are furnished from the coasts of Africa and the Indian Archipelago.

"In a society so constructed, the manners must be as varied as the materials of which it is composed; and ages must elapse ere they can amalgamate and assume a national form. This renders the Colonists peculiarly prone to adopt the customs of strangers; and as these adoptions are oftener the fruit of caprice than of sound judgment, they are apt sometimes to excite a smile. Can there be conceived, for instance, a more awkward or more ludicrous object than a huge boor heaving up his ponderous shoulders in imitation of a Parisian, twisting his neck, and drawling out, "Ik wit neit," whilst his utmost endeavours cannot throw the corresponding expression into a countenance where the muscles are so deeply imbedded in blubber, that even the convulsions of death could not produce any visible derangement of features.

"No difference of ranks exists at the Cape: and if the population be not occasionally reinforced from Europe, the distinction of colour will soon vanish. The intermixture of African with Europæan blood can already be traced in some of the first-rate families in the Colony: the hue of the skin and the lineaments of the countenance unequivocally betraying their origin. The abolition of the Slave Trade, and the facility with which the poorest inhabitants can, by ordinary activity and perseverance, obtain a competency, will accelerate this union, and it is probable that before two centuries shall have elapsed, all the colours will be blended in one.

"The complexion of the Cape ladies is, in general, fair, perhaps too fair. It is of that sickly delicate tint which indicates exclusion from the air and light. It is altogether deficient in the lively bloom which gentle exercise and exposure to the elements diffuse over the cheeks of the British fair. Great care is taken, while young and single, of their figures: they are accordingly then light and elegant in their form: but they are no sooner married than they begin to neglect their persons, and, by indulging in the pleasures of

the table, acquire a degree of obesity that renders them objects of disgust. The habit of using vegetable acids as seasoning to every article of food, soon destroys the teeth. So universal indeed is this defect, that a fine set of teeth never enters as an item into the catalogue of female beauty: and the total neglect of the brush renders such as they have offensive to the sight of any person of delicacy.

"Almost every private house in Capetown is open for the accommodation of such strangers as have occasion to take lodgings for any time in the town. This custom supersedes the use of taverns: but as it was originally the offspring of poverty and necessity, it will fall into disuse in proportion as the inhabitants become more opulent. The town may, at present, be aptly compared to a large inn on a well-frequented road. The same incessant routine of arrivals and departures; the same chaotic medley of characters; and the same insatiable thirst of gain, and disregard of reputation in the manner of acquiring it, are characteristic of both.

"There is a constant succession of Venduties, or public sales, in Capetown. These sales are a species of lottery, in which every person, but especially the old women, engage with astonishing avidity; though the chance of gain is fully as precarious as in the speculation that goes more properly by that name. Not a day passes without several auctions; and it is by no means uncommon that an article purchased in the morning at one, should be exposed in the course of the day for sale at another. The more considerable sales are advertised in the Cape Gazette, but the minor ones are announced by a crier, who goes about the streets beating a brass plate to attract notice. All the idlers run to those places, where they are sure to hear the politics and the scandal of the day discussed: at the same time, the low price at which they see articles knocked down, tempts them to stake their money, as they would at hazard or lansquenet. If the purchases are not of sufficient magnitude to authorize a sale at home, they send them to the first auction that takes place in their neighbourhood, where they must run the risk of meeting with profit or loss. On this principle, every inhabitant of either

sex is a merchant, and every house has either a shop or a store for the reception of these speculative purchases.

"What originally gave rise to, and still maintains, this rage for auctions, is the law of inheritance, by virtue of which, when the father of a family dies, his whole property is put up to sale, and the produce equally divided amongst his children. Government levies a tax of 3½ per cent. on every article sold in this manner, and the auctioneer has 1½ for his trouble in conducting the sale and collecting the money. I happened, some days ago, to step into one of these Venduties, where, among other articles, I saw three or four slaves set up to sale. This was altogether a new sight to me. I could not without pain remark the anxiety with which those poor creatures regarded the persons who were bidding for them. It seemed as if they wished to trace the character of their future master in the lineaments of his countenance, and showed indications of joy or fear, according to the opinion they had formed of his disposition.

"Among the terrible reactions produced by the slave trade, none is perhaps more merited or more evident than the dissoluteness of morals and ferocity of disposition which it creates among the people who are concerned in it. The cold-blooded calculator of profit and loss, the prime agent in this unhallowed traffic, feels its influence, but in a remote and subordinate degree. It is when we cast a view on those who are placed immediately within the sphere of its action that we perceive the full extent of its deteriorating effects; their morals, their temper, their air, and their very features confessing its malignant influence. The softer sex, more especially, are transformed by it into cruel tyrants. When you mix in female society, you look in vain for that cheerful play of features which indicates a sweet disposition; in vain you listen for that harmonious tone of voice which is mellowed by the habit of associating with one's equals.

"I was one day attracted to the window by a strange sort of noise that seemed to issue from a small court behind the house in which I lodged. On looking out, I observed my landlady in the act of administering correction to a slave boy,

who had, by some offence, incurred her displeasure. How shall I describe her appearance? Her figure was of the true Dutch cast, tall, fat, and coarse. An unnatural enlargement of the thyroid glands, which vied with her cheeks in size and colour, gave to her countenance a peculiar, but I cannot say an amiable, expression. Her voice resembled the notes of an angry Turkey-cock; with her left hand she held Mungo by the nape of the neck, while her right hand brandished a huge Shambok,* which she applied to his shoulders with the skill and perseverance of a dilettante. In the midst of her exertions, I could distinguish the epithets 'Rascal'—'scoundrel'—'slave'—and 'God d——n,' uttered with peculiar volubility of tongue, and repeated in a sort of measured cadence, corresponding with the manual exercise, of which they formed the accompaniment. I was the more struck with this last circumstance, as I knew that Juffrouw understood as little the meaning of these flowers of rhetoric, as did the poor culprit on whom they were so lavishly bestowed. 'How is this?' thought I, 'has the Dutch language become so polished that it cannot furnish terms sufficiently expressive of the angry passions;—or is the English so much more energetic in its expletives, that the mere sound, independent of sense, can wound the feelings on one side, and assuage the tempest of wrath on the other?'

"The slaves at the Cape are composed of more various races than are to be met with in any other part of the world where the traffic in human flesh is sanctioned. The coast of Guinea, Mosambique, Madagascar, Malacca, and the islands of the East, have contributed in their turn to supply the Colony: and from the intermixture of this heterogeneous groupe, aided by a dash of Europæan and Hottentot blood, a mongrel race has sprung up, which exhibits an astonishing diversity of feature as well as of disposition. Of all the unadulterated race of slaves, the Malay bears the most marked character. He is cunning, active, and intelligent; but, at the same time,

* A whip, in use among the Colonists, and made of a strip of Rhinoceros' or Hippopotamus' hide.

implacably revengeful. If a Malay commits a fault and is punished for it, there the matter terminates. But if he is only threatened, and fancies the punishment still hanging over him, he will commit the most atrocious actions to put an end to the misery of suspense. Desperate under the influence of this impression, he works himself into a state of delirium by swallowing opium: then draws his kriss or dagger, and stabs the whole family, slaves and all. Having glutted his vengeance within doors, he sallies forth into the street, and plunging his weapon into every living creature he meets, whether it be man or beast, he never ceases until he is shot, or is otherwise disabled from doing farther mischief.

" It is owing, in some measure, perhaps, to the dread of this savage retribution that the slaves are treated beyond comparison better at the Cape than in any other Europæan Colony: though it must be allowed that the very high price at which they are usually valued, will prove, with most masters, a strong check on harsh and inhuman treatment. The law does not entrust the master with the infliction of corporeal punishment; but directs that the culprit shall be sent to the common trunk or prison, where he receives a certain number of stripes, according to the nature of his offence. It may readily be supposed, however, that this law is frequently evaded, even in the town, and under the very eyes of the magistrates; and in the remote parts of the country it necessarily goes for nothing; the distance from the seat of justice adding to the difficulty and expense of complying with its mandates, in the same ratio that it insures impunity to the transgression of them.

" Before the British got possession of the colony, slaves convicted of capital crimes were sometimes put to the torture, because an acknowledgment of guilt, either voluntary or compulsive, was necessary to authorise the magistrate to pass sentence of death on the criminal. But this inhuman practice has been abolished by the British Government, and the sentence of death is executed now without any preliminary cruelties. The place of execution is at the base of the Lion's Rump, facing the Amsterdam Battery. Three pillars,

erected in the form of a triangle, support as many beams placed across them: and from these beams the criminals are suspended. It was probably to a gallows of this construction that allusion is made in Schiller's Play of the Robbers, in which somebody says, 'Maurice, beware of the beast that has got three legs.'"

Thus we see that neither the hurry of military movements, nor the proximity of the enemy, could hinder Capt. Carmichael from entering immediately upon his scientific researches, or availing himself of the hours which might justly be devoted to sleep or recreation, in order to become acquainted with the productions of the country. From his journal we transcribe the following notes on the animals of the Cape.

"The *African Rhinoceros* (*Rhinoceros bicornis*) differs from that of Asia, in having two horns instead of one. Its hide is smooth, likewise, and free from wrinkles. Of the hide of the *Rhinoceros* and *Hippopotamus*, the boors manufacture a sort of horsewhip, known by the name of *Shambok*. They first of all cut the hide into long slips, three inches in breadth, which are hung up, with a heavy weight appended to them. When thoroughly stretched and dry, these slips are again cut into three divisions, then tapered and rounded with a plane, and the polish given with a piece of glass, which renders them semi-transparent like horn. The horns of the *Rhinoceros* are solid. When turned in the lathe, and fashioned into drinking-cups, the article is held in high repute among the colonists as an infallible detector of poison. They firmly believe, according to the ancient creed, that if any noxious fluid were poured into a cup of this description, it would instantly *foam and boil over the brim.*

"Of all the quadrupeds that prey upon birds, the *Ratel,* (*Viverra mellivora*) a species of *Ursus,* according to Mr. Burchell, is perhaps the most destructive. When I was at Algoa Bay, Capt. Lawrence and Dr. Ingham, my next-door neighbours, amused themselves with breeding poultry. As their hen-roosts happened to stand contiguous, the fowls used to lay their eggs indiscriminately in that which was

most convenient. This introduced frequent altercations between the owners, respecting the property of the eggs, each of them pretending to discover, by infallible marks, the produce of his own fowls. The scene of these disputes was usually at my door, which was regarded as a sort of neutral ground; and as their arguments were usually long and loud, my situation, as a listener and often a referree, was rather an unpleasant one. Hints or entreaties, on my part, could never prevail on them to move an inch from my threshold, and the subject was becoming every day more harassing, when my good genius, in the shape of a *Ratel,* came and took up its residence in our neighbourhood. In the course of one night, this destructive vermin put an end to all disputes, by cutting the throats of all the fowls, to the number of two dozen and a half, most of which were found next morning weltering in their blood. It carried off two or three to its burrow, to which we traced it by means of their feathers, and after a great deal of labour, succeeded in destroying it.

"The *Ratel* is also exceedingly fond of honey, and securely plunders the hive, whilst the bees exhaust their fury on its impenetrable hide. It is, of all animals, perhaps, the most tenacious of life; the skin being so thick and so loosely attached to the carcase, that it is proof against every species of violence.

"The *Chameleon* of the Cape is about six inches long. Unlike the rest of the *Lizard* tribe, which are generally flat, its body forms a sharp ridge, serrated along the back. The skin is rough, or rather studded, like shagreen. The toes are in two divisions: the external division of the fore feet, corresponding to the fingers of the human hand, consists of three toes, connected by a membrane as far as the claws; the inner division, answering to the thumb, consists of two, connected in a similar manner. In the hinder feet, the division of the toes is reversed; the outer consisting of two, the inner of three. The toes, thus connected, acting in the manner of forceps, serve admirably to grasp the minute branches, among which the reptile lurks for its prey. I had several chameleons for months in my room, and often amused myself in giving

them hold of a long thread, suspended from the twig on which they usually perched, and they would invariably climb up to the twig, 'hand over hand,' as seamen term it.

"All the motions of the chameleon, except those of its tongue, are extremely slow and deliberate. At every step, it pauses, coils its tail round the twig, and turns its eye in every direction. The eyes are exceedingly prominent, and covered all over with the common skin, excepting a very small orifice, through which the light is admitted. They turn in their sockets, like scioptic balls, and their movements are entirely independent of each other. When one eye is turned forward, and the other backward, the animal's scope of vision embraces the whole horizon at once.

"The prevailing colour of the Cape Chameleon is a verdigris green, which verges at night to a golden yellow, and in the daytime, frequently, to a dark grey. Along the side, there runs a broad stripe of a pale cream colour, which in its shades keeps pace with the changes that occur in the predominant hue. As to the notion that the chameleon changes its tint to that of every object on which it is placed, I never could perceive it. I am rather inclined to think, that the variations of colour are quite independent of external objects, except so far as these tend to irritate or excite it.

"The chameleon is viviparous. It drops its young, enclosed with a portion of fluid in a membranous bag, which adheres by means of its slimy surface to the first object it touches. In the course of a few minutes, the fœtus bursts through its envelope, and enters on its natural vocation of fly-catching.

"The amphibious *Lizard*, known by the name of *l'Iguane*, a variety of the *Lacerta Monitor*, is common in the rivers of Lutenhage. This reptile is of a black, or rather a bistre colour, beautifully speckled with yellow, and measures four or five feet in length. It loves to bask in the sunshine, among the rushes and on overhanging cliffs; but plunges into the water on the slightest alarm, and remains at the bottom until its fear has subsided. Being told that the flesh of it is eatable, we directed our cook to prepare a dish of it for our dinner. Its taste resembled that of a rabbit, but the novelty of

such an article of food, strengthened perhaps by veneration for the dietetical law of Moses, deterred most of us from meddling with it. The fat, melted over the fire, runs into an oil, the effluvium of which is deleterious to ants, and keeps those insects at a distance from all articles on which it is rubbed. The Boors have an idea among them, that this *Lizard* sucks the cows, when they happen to pasture near the banks of the river.

"The Boors and Hottentots in the vicinity of Algoa Bay, collect vast quantities of wild honey, which they find in the hollow trunks of decayed trees, in the deserted nests of the *Termes*, (or white ants,) in the crevices of rocks, and in holes burrowed in the ground by the chacals and hyenas. The hive is usually revealed to them by a bird, called, on this account, the *Honey-Guide*, (*Cuculus Indicator*.) This feathered informant, though particularly fond of honey, cannot procure it but by the aid of others. It therefore watches the appearance of those, from whom it expects the gratification of its appetite, and advertising them by a peculiar and well-known note, leads the way, flitting from bush to bush, to the spot where the hoard is deposited. There is an inconvenience of some moment, however, that attends implicit reliance on the call of this extraordinary caterer, which is said to amuse itself in leading its unwary follower across the haunt of a lion, tiger, rhinoceros, or other natural curiosity of that stamp, which he feels, perhaps, no particular anxiety to study. This is universally believed by the Boors, and may be true enough. But though we admit the fact, I should think we may safely reject the inference. The nature of the country where bees and *Indicators* are met with, is such, that the latter, in conducting you to the stores of the former, may occasionally cross the path of one or all of those animals; but it can hardly be credited that the bird, which, in alluring you, seeks only its own gratification, would designedly lead you to the disappointment of both.

"The *Swallows* are migratory at the Cape as well as in Europe: and appear at Algoa Bay in the month of September. Of the three species which I observed there, one is the

Hirundo capensis. A pair of these built their nest on the outside of the house wherein I lodged, against the angle formed by the wall, and the board which supported the eaves. The whole of this nest was covered in, and it was furnished with a long neck or passage, through which the birds passed in and out. It resembled a longitudinal section of a Florence oil-flask. This nest having crumbled away after the young birds had quitted it, the same pair, or another of the same species, built on the old foundation again in the month of February. But at this time, I remarked an improvement in the plan of it, that can hardly be referred to the dictates of mere instinct. The body of the nest was of the same shape as before, but instead of a single passage, it was furnished with one at each side, running along the angle of the roof; and on watching the birds, I observed that they invariably went in at one passage and came out at the other. Besides saving themselves the trouble of turning in the nest, and disturbing, perhaps, its interior arrangement, they were guarded by this contrivance against a surprise by serpents, which frequently creep up along the wall, or descend from the thatch, and devour both the mother and her brood.

" Amongst an infinite variety of insects, natives of the Cape, my attention was frequently attracted to the operations of that species of beetle, which is termed by Entomologists, *Scarabæus sacer*, and known to the vulgar under the homely, but expressive name of *Tumble-dung.* These insects beat about with the sagacity of the best bred pointer, in search of the material from which they derive their trivial appellation. You sometimes see upwards of a dozen of them assembled round a cow-dung, and actively engaged in cutting it up into fragments of a certain size. Their labour, however, is not a combined one, for the meeting of so many on the same spot is merely a proof of the acuteness of one of their senses. Sometimes a couple of them labour on the same lump, apparently unconscious of each other's interference; but, in general, each individual works for itself. When the fragment is detached, the insect kneads it, by a dexterous management of its head and legs, into a globular form, preparatory to its

being moved off to its subterraneous receptacle; for it may be remarked, that, even if the ground should be equally fit for their purpose, they never lodge it near the mass from which it was severed; but, invariably, roll it away to a considerable distance; actuated, as I should conjecture, by fear of their own species, lest they should deposit their ova in it. Their method of moving the ball, is, in itself, singular, and may have been the unsuspected cause of much learned speculation. The insect rests its head and fore legs on the ground, and pushing with its hind legs against the ball, gives it a progressive motion, while its own is strictly retrograde; and thus, regardless of all obstacles, trundles it on, beyond the reach of observation, then makes a hole for it, some inches deep in the sand, and covers it over.

"Though these insects labour with uncommon assiduity when they do begin, I could observe that some of them preferred the piratical to the mechanical mode of acquiring property; and witnessed many a warm scuffle with these marauders, that endeavoured to get possession of the finished balls of their neighbours, instead of carving for themselves. As their system of attack and defence is, however, such as gives the possessor of the ball a considerable advantage, fortune, in these engagements, usually sides with justice. As soon as the robber has fixed his eye on a ball that hits his fancy, he alights within a short distance, and having folded his wings under the sheath, pushes straight for it. The other, instantly taking the alarm, posts himself on the top of the object in dispute; and as soon as his antagonist comes within reach, gives him, by a certain movement of his head, a chuck under the chin, that pitches him, heels over head, to the distance of ten or twelve inches. After a few rounds of this sort, he walks off, satisfied that nothing is to be gained by continuing the combat.

"One evening, it was, I think, about the middle of May, as we sat enjoying ourselves after dinner, we observed a number of flies, of an uncommon aspect, flitting past the tent. We started up and endeavoured to catch one of them, but without effect. Some Hottentot children, who were standing on an

opposite bank, remarking our anxiety, came and offered us whole handfuls of them; and directing us to the spot where they had caught them, our astonishment is not to be expressed, when we beheld millions of winged insects, issuing into daylight, through fissures in the earth, and through the pores, as it were, of the ground, where no opening was perceptible. Near these outlets, the children had posted themselves, and collecting the insects as they emerged, greedily devoured them. Such of them as escaped the Hottentots, were snapped up as they flew along by the small birds, and by the *Libellulæ* and other predatory flies. The body of these tiny insects is so small, and the wings are so large and unwieldy, that they could hardly support themselves in the air, as they floated along at the humour of the breeze. They were the males of the *Termes capensis;* commonly known by the name of the *White Ant.*

" No country in the world is more infested with ants than the Cape. These insects vary in size, from the red *Nigar,* scarcely visible to the naked eye, to the *Black Ant,* measuring nearly an inch in length. Their habitations are as various as their species. The smaller tribes excavate the ground, removing the soil, and depositing it as a rampart round the entrance, to keep off the water. The large black ants content themselves with enlarging such cavities as they find ready formed, under flat stones, thus providing themselves with an impenetrable roof. A smaller species of the same colour, constructs its nest on the top of a bush, enclosing such parts of the branches as come within the sphere of the external covering, which is as thin as paper, yet proof against the heaviest rain. But the most numerous and interesting insects are the *Termites,* of which the Cape furnishes several kinds. Of these, one species builds its nests on the surface of the ground. These are fabricated of loam, of an hemisphærical shape, four or five feet high, and as much in diameter. In some districts, these nests cover the surface of the ground in immense numbers, standing within a few yards of each other, and resembling so many boulders of granite. Struck with the prodigious disproportion between the size of

the *Termites* and that of their habitations, an Irish gentleman of my acquaintance was heard to exclaim, 'By the powers! is it not wonderful how these little creatures, the ants, can make such large mole-hills!'

"A large species of *Fly*, (*Musca rutilans*,) common at the Cape, is sometimes, if not always, viviparous. Possessed of a peculiar acuteness of scent, they assemble in numbers, wherever their favourite ordure is accidentally let fall, and deposit their young, which begin to crawl over it the moment they are dropped. As the proper nidus is not always at hand when wanted, it is probable that this insect has the power of retaining its eggs beyond the natural term; that, in the meantime, the process of hatching goes on; and that the larvæ are at length evolved in the ovaries."

We shall here introduce Capt. Carmichael's observations, made on his return to Africa from the Mauritius.

"Some time after the regiment returned from the Mauritius to the Cape, in 1815, I made a short excursion into the country, in company with a party of sportsmen, who wished to retreat for a few weeks from the dust and the South-Easters of Capetown. We left town on the morning of the 3d of January, and directed our course across the Isthmus which connects the Cape Peninsula with the mainland. Though it was about the middle of the dry season, we had the benefit of several heavy showers from the westward during our ride, with which we felt the less annoyed, though drenched to the skin, as they fixed the moving sand, and tempered the scorching heat of the atmosphere. In the rainy season, the whole of this plain is a series of marshes, intersected by ridges of sand. At the time we crossed it, these swamps were mostly dried up; but wherever the surface was in the least depressed, there were still manifest indications of the existence of water. There can be no doubt that abundance of this element might be procured in every part of the Isthmus by digging to the depth of a few feet: at all events, by digging to the level of the sea, which is not much more, we are taught by experience, as well as by the laws of Hydrostatics, that not here alone, but in every region of the globe, a supply

of water can be depended on. With such a resource, skilfully applied, this barren waste might be converted into fertile gardens; from which the capital could be furnished with an abundant supply of vegetables, and an end put to the present monopoly of these articles, by a few farmers in the immediate vicinity of the town.

" A great part of the plain is covered with a fine siliceous sand, furnished by the disintegration of the sandstone mountains which surround it. It shifts perpetually from place to place at the humour of the breeze, forming a succession of banks, or ridges, white as driven snow. This periodical motion has a singular effect on the shrubby plants which are scattered over its surface. When suddenly overwhelmed by the sand, they push up their tops until they emerge into daylight; but the lower branches are all suffocated, and the trunk, now converted into a root, sends off a new system of branches, which direct their course downward through the drift. In proportion as the sand accumulates, the plants grow up, keeping their heads above the surface; but without any apparent stem. A squall comes on, the bank is dispersed; and the shrubs, now laid bare to the original level of the soil, exhibit the grotesque appearance of so many *Mangrove-trees.*

" Though the flowering season was pretty nearly over, I observed a variety of plants still in blossom; among others, a large blue-flowered *Aristea*, a *Dianthus*, and several species of *Passerina*, particularly the *P. grandiflora* and *uniflora*. The greater part of the Isthmus is covered with shrubs of this last genus, which are in much request in Capetown, as the material usually employed to heat the bakers' ovens. The genus *Restio* is likewise abundant, and communicates somewhat of a glassy appearance to the surface; but these plants, except during the earliest stage of their growth, are rejected by cattle.

" The diagonal extent of the Isthmus from Capetown to Brinksfarm on the Eerste River, is about twenty-four miles. Throughout this dreary expanse, not a house is to be seen, nor an object to relieve the eye, or divert the mind from its own reflections, except here and there a waggon in its pro-

gress to or from Capetown, halted at the road-side, and its team of oxen browsing amongst the shrubs. In their intercourse with the capital, the boors are under the necessity of arranging their affairs so as to remain there only a few hours, or, at least, to send off their waggons, the sterility of its immediate environs rendering it impossible to find subsistence for their cattle there for a single night.

"From Brinksfarm, the road winds round the base of the mountain of Stellenbosch, and commands a fine view of the whole Cape Peninsula and the adjacent bays. Several neat plantations are scattered over each side of the road, as far as Hottentot-Holland Kloof. As we rode along, it was not without interest we remarked the country people actively employed in their various occupations; some collecting the juicy produce of the vineyard; some cutting down the corn, conveying it home in waggon-loads, piling it up in huge stacks, or guiding the horses, which were trotting over it, to disengage the grain from the straw. To these succeeded another set, who, availing themselves of a favourable breeze, tossed the broken corn up in the air with long wooden forks, to separate the grain from its impurities. This animated scene, on which we dwelt with delight, formed a striking contrast to the early part of our day's journey.

"There is an inn at the bottom of the Kloof, where we tarried the whole of the next day, to get some repairs done to our travelling cart. On the morning of the 5th, we pursued our journey; and, after passing through a turnpike-gate, the only one in the Colony, at which half a Rix-dollar is levied on every waggon, we ascended the Kloof. The pass is rugged and abrupt, but might be made comparatively easy by a moderate share of labour, judiciously exerted: and if the public welfare had any influence over those who administer the affairs of the Colony, they would employ a part of the garrison in works of this kind; instead of letting soldiers out to work in detail, to such individuals as have sufficient interest to procure them for their private use.

"The South-East wind blew in impetuous gusts as we ascended the Kloof; but from the time we gained the summit

it became comparatively moderate. It is seldom, indeed, known to blow with much violence beyond the first chain of mountains. The country on the other side is high, barren, and covered with hard rushy plants, among which the genus *Restio* predominates. A few miles beyond the Kloof, we crossed a branch of the Palmiet River, and keeping to the left, followed a path recently made over the Nieuberg, which led us to the farm of Stephanus Leroex, where we proposed to halt for some days. This farm is situated in a fine amphitheatre, enclosed on one side by a bend of the great chain of mountains that commences at Hangklip Point, and on the other by the Nieuberg. The area is about ten miles across, and forms a gentle slope from the circumference to the centre, with a smooth verdant surface, regularly undulated, and watered by numerous mountain-streamlets, which meet in the middle of the valley, and form the swampy source of the River Sonderend. The channel of this river, as well as its tributary streams, is encumbered with the *Palmiet*, a gigantic species of bog-rush, (*Juncus serratus*,) that spreads and interlaces its creeping stem over the surface, forming a strong elastic net-work, upon which a man may walk without the least risk of sinking. The leaves of this plant bear a strong resemblance in figure and disposition to those of the smaller species of *Pandanus*. The stems, stripped of the foliage, are used by the wine-farmers as padding to fix the leggers against the sides of the waggons, when they send their wine to the market. After serving this purpose, they are flung out on the streets, and being of a black colour, very heavy, and much of the same size, gave rise to the ludicrous mistake of a certain English traveller, who has informed the public that the streets of Capetown are paved with bullocks' tails.

" Though the surface of the ground here, as well as in most other parts of the Colony, appears at a distance abundantly verdant, the produce is mostly of an useless, if not noxious quality, such as cattle invariably reject. A few straggling tufts of *Aristida*, *Holcus*, *Ehrharta*, and *Anthistirea*, spring up here and there among a profusion of bulbous rooted plants, and *Syngenesious shrubs*. In the vicinity of the

farm-houses, you meet with patches of *Agrostis linearis*, a sweet grass, always cropped close to the ground; but no where with a grassy turf of any extent. This is a remarkable circumstance in a country so much favoured in point of climate; and where the variety of indigenous grasses is as great as in any other portion of the world of equal extent. Several causes, it is probable, contribute to produce this uncommon sterility. The high winds, so prevalent for the greater part of the year, but more especially about the period when the grasses are in flower, either damage the whole plant, prevent the fecundation of the germ, or shake out the grain before it arrives at maturity. At this season, likewise, the periodical rains cease; and such of the seeds as had escaped the effects of the wind, fall on a parched soil, where they must remain in a torpid state until the next rainy season sets in, after a lapse of six or seven months. They lie, in the meantime, exposed to the depredations of an infinite variety of birds and insects, particularly of the ants and termites, with which the surface of the ground is absolutely animated. These destructive insects retain their activity throughout the year, and are constantly in motion, day and night; nothing therefore in the shape of food escapes them. They never attack any part of a living plant; but seeds of all sorts are devoured by them on the spot, or carried off to their magazines.

" It is owing, perhaps, to this interruption in their natural progress to maturity and decay, that these grasses almost invariably throw out branches from the joints, after the main stalk has failed. These branches succeed each other after each successive miscarriage, and it is not uncommon even to find secondary branches issuing from the joints of the primary ones. Thus their existence appears to be protracted beyond the natural period, in efforts to fulfil the end of their creation. Notwithstanding these efforts, however, the greater part of them must have ceased long ago to exist, were it not that they possess the faculty of propagating themselves by the root; which they accomplish either by pushing out long creeping shoots, sometimes over, at others underneath the surface of the soil; or by forming a regular succession of

bulbs, which retain the vital principle during the dry season, and shoot up into new plants on the return of the rain.

"The surrounding mountains are overrun with that singular plant, the *Lanaria plumosa*, which gives them a hoary aspect, distinguishable at a great distance. They consist of sandstone, the strata of which dip at an angle more or less acute to the eastward. The whole chain, from Hangklip Point, to the extremity of the Karroo, exhibits the same conformation; by which the vallies on the east side of the chain are enriched with numberless streams, while the supply on the opposite side is comparatively scanty. The soil in the valley consists of gravel, cemented by an argillaceous earth. In summer it is as hard as stone, but absorbs moisture greedily, and after a copious fall of rain, becomes penetrable to the plough.

"As this valley is noted for game, we pitched our tent as soon as the cart arrived, having agreed to remain here some days. We had provided ourselves with a canteen, cooking utensils, and liquors. Our sportsmen were to furnish the table with game, and Leroex with the produce of his farm and garden. It was soon remarked, however, by one of our party, who had been here some years before, that the farmer made a most enormous charge for his share of the contribution. Being challenged on the subject, he candidly acknowledged it, and stated that he considered his old charges sufficiently high, but that an English sportsman having once stopped for a few days with him, laughed at the modesty of his charge, and paid him double the amount. To avoid being ridiculed by the English, he had from that time modified his prices, with a view to acquire their good opinion. This liberal Englishman proved to be a ship-chandler from Capetown, who had contrived to escape for a week from behind the counter.

"The chief kinds of feathered game in this valley, are two species of *Partridge*, the grey and the red-winged, (*Tetrao Afer* and *capensis*,) the *Common Snipe*, and the *Golden Snipe*, (*Scolopax capensis*.) Our sportsmen were much disappointed at the unexpected scarcity of these birds, and more so at the

difficulty of springing them when found. At this season of the year, the ground in the uplands is so hard, that the *Partridges* are unable to dig into the soil for the bulbous roots that constitute the chief part of their food. They remain, therefore, in the low marshy bottoms, where the soil is still penetrable, and are no sooner put up, than they fly in among the *Palmiet*, where neither sportsman nor dog will willingly follow them. The *Snipes* are migratory here, as in Europe, and had just begun at this time to return to their usual haunts for the winter.

"*Roebucks* and *Duykers* were seen daily; but one only of the latter was shot. A *Klipspringer* likewise was killed, and in rather a curious manner. Hunting about, one morning, after *Partridges*, our party heard the barking of dogs on the face of the hill above them. On going to the spot, they found a *Klipspringer* standing at bay on the top of an insulated rock, and beset by three or four wild dogs that kept incessantly barking at him. A shot or two brought him to the ground. The usual method of hunting this active little antelope is to set a number of dogs on his scent. They no sooner give chase, than he runs to the nearest accessible rock, and perches there, secure, as he thinks, from danger. The dogs, in the meantime, surround the rock to prevent his escape, and begin to bark. The hunter, knowing by this signal that his game is securely lodged, walks leisurely to the spot, and shoots him.

"The fur of the *Klipspringer* is very thick and soft, but intermixed with long hairs of a stiff bristly quality. Mr. Barrow says of this fur, that 'it has the singular quality of being so brittle that it breaks instead of bending, adheres loosely to the skin, and is so very light, that it is used as the best article that can be procured for the stuffing of saddles and mattrasses.' It would not readily occur to most persons, that fragility is a desirable quality in a material used for stuffing; and though a fold of hogskin might warrant from damage the nether-end of a rider, I should fear that those who would lie down to sleep on mattrasses so stuffed, could hardly fancy themselves reposing on a bed of roses.

"On the evening of the seventh, we were surprised after having retired to rest, by a smart thunder-storm, attended with a heavy fall of rain, which rendered our tent untenable, and forced us to take shelter in Leroex's house. This family, though within a moderate day's journey of Capetown, is as destitute of, and as unacquainted with, the most ordinary comforts of life, as any of the erratic boors on the precincts of Caffreland. Leroex has few slaves, and is apparently poor; but this is no excuse for the filthy, slovenly state of his whole establishment, which is quite revolting, and forms a striking contrast with the studied neatness observable in the domestic economy of the boors in general. We had a pleasant instance of this in the society of two or three clutches of chickens with their dams, that claimed a prior right to the apartment wherein we pigged together, and asserted it with a noise and clamour that forced us to quit the house at dawn and to betake ourselves again to our tent.

"The dwelling is furnished, like almost every other in the country, with three or four spreading oaks before the door, to ward off the sunbeams; and a clump of *White Poplars* in an adjoining marsh, which supply spars and small timber for the use of the farm. There is likewise a small corn-mill, of an extremely simple construction. It consists of a horizontal water-wheel, revolving on an axis, the upper end of which is fixed in the mill-stone, and turns it round at the same rate at which the wheel moves. This mill is a slow grinder, but it has the advantage of requiring little or no attendance.

"We quitted Leroex's on the 12th, and proceeded to Daniel de Tait's farm, situated on another branch of the Sonderend, at the distance of twelve miles. Early next morning, three of us set off to visit the Moravian establishment at Bavians Kloof. The road runs along the bank of the Sonderend, through a valley undulated in the most agreeable manner, and watered by copious streamlets, pouring down the side of a lofty chain of mountains that rise abruptly on the left. The river itself creeps sluggishly along the vale, its channel contracted by a thick border of *Palmiet*. As we rode along, a flock of roebucks would start up now

and then before us, and, bounding to a short distance, turn and gaze at us until we passed; but when we started a solitary *Steenbock*, which happened more than once, it sprang along the plain with surprising agility, and never stopped until it had got out of sight. It is the character of almost all animals to be timid when solitary, and to pluck up courage in proportion to their numbers.

" The village of Bavians Kloof, Gnathendhal, as the missionaries call it, is situated at the foot of a high rugged mountain. A copious stream, bursting through a deep chasm in its side, traverses the village, and after watering a long suite of small gardens, discharges itself into the Sonderend. It was on the banks of this stream I first saw that beautiful plant, the *Wachendorfia thyrsiflora*. The upper part of the village, occupied by the missionaries, consists of a line of houses, divided into separate apartments, to each of which is attached a workshop; of a mess-room, where the whole society eat in common; a church, a school-house, and an inn or sleeping-place for the accommodation of strangers. There are at present five Europæans attached to the establishment, each of whom is master of a mechanical trade, at which he labours daily, assisted by a certain number of Hottentot youths, who are regularly apprenticed, and instructed in their respective trades. Most of them are married, and their wives are distinguished by a head-dress of a peculiarly primitive form. Among the latter, we were agreeably surprised in recognizing a countrywoman of our own, a native of Cumberland. She appeared as much gratified as ourselves at the meeting, and paid us a great deal of attention. The men are all past the middle age, sleek, cheerful, and disposed to gratify every rational inquiry respecting the institution. There is a good orchard and a small vineyard attached to it, from the former of which they are supplied with abundance of excellent fruit, and from the latter, a few leggers of a wine that scarcely merits the same encomium.

" The Hottentot quarter, extending nearly a mile from the church, consists of huts, of all shapes and sizes, scattered along the banks of the stream. Many of these cabins display

some ingenuity in the construction, and taste in the interior decoration. Several are furnished with a hand-mill or quern for grinding their corn, and an oven for baking. Their inmates were decently dressed, cleanly in their appearance, and all employed in some useful occupation. In others, however, we could remark a strong predilection for the sheepskins and wigwams of their ancestors; but this, we were given to understand, was confined to the more recent recruits, and it was expected that the example of the others would soon wean them from their ancient habits.

"The number of Hottentots at present on the list of the institution, was stated to us at thirteen hundred souls. A portion of land equal to one farm, or three miles square, is allotted for their support. This allotment, which gives about one hundred and forty-four souls for every square mile, though more liberal than what obtains either in France or England, is by far too scanty, considering the poverty of the soil in general; and forms a singular contrast with that which prevails throughout the Colony, where it is estimated that the square miles are to the souls in the ratio of two to one. This restriction has, however, one good effect; it prevents the Hottentots from withdrawing altogether from the service of the farmers, a step which would create much embarassment during the busy periods of spring and autumn. The greater part of the able-bodied men, accordingly, quit the village at those seasons, and hire themselves out to work on the neighbouring farms.

"Some of the young Hottentot girls are instructed by the matrons in needle-work, and the produce of their industry is in great demand among the country *vrouws*. Strangers, also, who casually visit the establishment, provide themselves with specimens of these articles, as well as of the cutlery-work, executed here with uncommon neatness, for the purpose of showing their friends what a Hottentot can do. All this is very foolish. The world is now pretty well satisfied that nature has not measured the human intellect by the colour of the skin, or the degrees of latitude; and that the African requires nothing but instruction to render his intellectual, as

well as his mechanical talents, equal to those of the Europæan, who has so long oppressed him, under the plea of his being an inferior animal. That the Hottentot is not by nature deficient in mechanical talents, any one may be convinced, who will visit this establishment; and his intellectual capacity is placed equally beyond dispute by the rapid progress of the rising generation in the elementary branches of learning. The school is a recent institution, commenced under the patronage of the late Governor, Sir John Craddock. The system of instruction followed is that of Joseph Lancaster. Little did that ingenious quaker imagine that his invention, opposed as it was by the united ignorance, prejudice, and bigotry of England, should within so short a time penetrate to the farthest extremity of Africa; and shed its benignant light on the most wretched portion of the human race.

"On the motives that dictated the establishment of the Moravian Mission, and the plan on which it has hitherto been conducted, there can be but one opinion; both are entitled to unqualified approbation; yet so unpropitious are the circumstances connected with it, that there is reason to apprehend that it will do more harm than good, and aggravate the misery it was its object to lighten. The population of the Colony consists of two races of people; the white, or descendants of Europæans, and the black, or Hottentots, who are parcelled out among the former, and serve them in the capacity of menials. Thinly scattered over a prodigious extent of territory, and repelled, by natural difficulties, but much more by positive enactments, beyond the reach of justice, the distant Colonists live in a state of independence, over which the government has no effective control. Hence they have usurped full authority over the rights, and not unfrequently over the lives of their dependents; and the capricious exercise of it, we can easily imagine, has been the source of no small portion of misery to the latter. Laws have been enacted from time to time, with a view to curb this abuse; but laws issued without the power of enforcement, are more likely to increase than to restrain abuse, from that sort of vindictive pleasure which men often feel, in

showing their contempt of law, when they can do it with impunity.

"Under such circumstances, it appears to me that the scheme of instructing the Hottentots is radically wrong, unless it be accompanied with such an arrangement as shall place them permanently beyond the power of their masters. Situated as they are at present, its only effect will be to add to the other bad passions, of which they have been so long the victims, that of envy at their superior attainments. An instructed and intelligent race of people, serving another race which is neither intelligent nor instructed, would be a monster in human society, of which there is no example on record. To instruct the menial, without first instructing the master, can serve no useful purpose. If this devoted race is to experience any alleviation of its misery during the future part of its progress to extinction, it must be effected by infusing the principles of humanity into the bosoms of those who hold its destiny in their hands.

"It is nonsense to dissemble. We may safely prognosticate the speedy annihilation of the Hottentot race, by the natural progress of society, and the rapid increase of a population, with which it can neither mix nor amalgamate. Who is there, indeed, that cannot discern from afar the fate of America impending over the whole of this continent? When the energy, the industry, and the genius of Europe are pitted against the ignorance, the indolence, and the apathy of Africa, the final issue, though it may be distant, cannot be doubtful: and if such a revolution could be effected in the progress of time, and without those wars and convulsions that usually attend the collision of nations, is it not—'a consummation devoutly to be wished?'

"We left Bavians Kloof at four o'clock next morning, and retraced our way to De Tait's, where, having rested till one o'clock, we mounted again, and proceeded to join our party at the Branaa Valley, where we arrived in the evening, after a ride of fifty-one miles. This valley, or rather plain, is a tract of marshy ground, three miles in extent, overgrown with reeds, rushes, and other aquatic plants, and harbouring

flocks of wild geese and ducks, herons, snipes, hammerkops, sand-larks, and pipers. It is fed by a stream of tepid water that issues from the base of a low rugged mountain, branching from the great chain already mentioned. The water oozes out imperceptibly through a clear sandy bottom, twenty yards by ten in diameter, and converted, by an artificial embankment, into a pool two feet deep, from which it escapes in a rapid stream, of sufficient volume to turn the largest mill. In a thermometer plunged into the pool, the mercury stood at 143°. The water is entirely void of colour, taste, or smell, and, when cooled, is not distinguishable from the purest spring water. It dissolves soap, and is used by the family settled in the vicinity for all culinary purposes. Along with the water, a vast quantity of gas is discharged, which ascends in large bubbles, and agitates the surface of the pool as if it was in a state of ebullition. Whether it is merely atmospheric air, or a gas of still greater purity, I had not the means of ascertaining; but it may be inferred that it possesses no deleterious quality, from the number of nests of the *Loxia sulphurata* which we saw suspended from the lower branches of some *White Poplars* stretched over the pool, and constantly enveloped in its steam.

" Vegetation is nowhere more luxuriant than on the border of this spring. Even the bottom of the pool is tufted with *Confervæ;* and the embankment is covered with a species of *Cyperus*, the roots of which are in contact with the water. Close along the margin of the pool, I remarked the *Arum esculentum*, *Leersia thermalis*, (*Carm.*) *Dodonæa angustifolia*, *Rhus angustifolium*, and *Aspidium tenellum*, (*Carm.*) Half a mile from the source, and at the temperature of 102°, the *Menyanthes indica*, *Typha angustifolia*, and various species of *Scirpus*, *Juncus*, and *Cyperus*, grow in the midst of the stream. In a ditch not far from the hot spring, I found the *Isnardia palustris*, a plant hitherto unknown as a native of Africa.—Sportsmen must be on their guard in approaching this spot, to which they are allured by the quantity of snipes that harbour in the marsh. We lost one of our best pointers the very evening we arrived. In attempting to

cross the stream, near its source, the poor animal was scalded to death.

"On the 17th we resumed our journey, leaving the Branaa Valley early in the morning, and passed through an extensive, well-watered, and fertile plain, called the Goudinie. This plain is crossed by a river of the same name, by the Breede River, and by several less considerable streams, all of them flowing on a level with the surface, and capable of being turned with ease over the interjacent grounds. After a ride of three hours, we arrived at the habitation of Feld Cornet Gabriel Hugo. During our journey, we met numbers on their way to a Vendutie, which was to take place in the Goudinie. These sales afford the only opportunity the Colonists have of assembling from distant parts of the country, and are therefore attended by ten times the number that have any idea of making purchases. On such occasions, it is the usual custom to provide a sumptuous dinner for the crowd, followed by a copious libation of wine and strong liquors; the latter sometimes with an eye to a brisker competition among the bidders, as was probably the case here, in one instance at least that came to our knowledge, where a common slave, with his wife and one infant, were purchased at the enormous sum of nineteen thousand guilders.

"Within half a mile of the Cornet's house, our cart broke down, and one of its wheels was shattered to pieces. At any other stage of our journey, such an accident would have left us in an awkward predicament. Fortunately there was a waggon-maker settled in the neighbourhood, who undertook to repair our vehicle, and effected it in two days. This man affords a striking proof that the boors do not all merit the sweeping charge of idleness and want of industry that has been preferred against them. He is himself an expert blacksmith, and has brought up his two sons as carpenters. With very little assistance from a few slaves in the simpler and subordinate parts, they make the best waggons perhaps in the Colony, for which there is a much greater demand than they can supply. He showed us a horse-waggon which he built

for the use of his own family, and for which he refused a thousand Rix-dollars.

" In the boor's house, the best apartment is always reserved for strangers. It is usually furnished with more than one bed, and will accommodate a pretty numerous party, provided they conform to the country fashion of turning in, two or three together. With the ample materials they possess, it would be desirable that the colonial system of cookery were a little more varied. It never passes the limits of stewed and boiled. Of the art of roasting they have no conception; and the beaf-steak and mutton-chop are known only on the outskirts of the colony, where they are broiled by the yard, after the primitive manner of the Hottentots. They have a variety of vegetables for the table, but appear to set no great value on them, owing, perhaps, to the superior excellence of their bread. There is, however, one vegetable which you never miss; that is cucumber, garnished with slices of onion, and floating in a sauce compounded of oil, vinegar, and pepper, poured on boiling hot.

" Each cover is furnished with a white napkin; but the duty of its office is executed by a deputy, the *Vaatdock*, (dish-clout,) which circulates from hand to hand, and from mouth to mouth, while the other is kept carefully folded up, to be paraded again at next meal. The carving-knife and fork have not yet penetrated beyond the isthmus; nor is the table furnished with supernumeraries even of the common sort. Every person takes his own knife and fork to carve what stands before him; the dish is then sent round, and each sticks his fork into a portion of it as it passes. Strangers of morbid delicacy will do well on these occasions to help themselves to all they require when the dish makes its first round, as the boor is not very particular in the uses to which he puts his fork during the repast.

" The character of the African peasantry has been a favourite theme of vituperation to several travellers who have treated of this colony. One really cannot peruse, without feelings of disgust, the pictures of sloth, ignorance, vulgarity, and cruelty, which have been drawn.

Not that individuals may not be found in this as in other countries, to whom some, perhaps all of these epithets may be applicable, but we must protest against drawing general and sweeping inferences from a few solitary facts. No person ever dreamed of holding up the African boor as a pattern of all that is amiable and excellent; but he will be found at least as far removed from that of absolute depravity, to which some travellers would sink him. Authors lay on their colours so thick, indeed, touch and retouch the picture so often, that the whole has the appearance of a caricature, and we are instinctively led to doubt the accuracy of the resemblance. This doubt is not a little strengthened by the eagerness with which they hurry to expose the portrait to view. The usual practice with travellers is, first to visit and study a people, and then to draw their character. Some reverse this order, and, like the ingenious Irish historian who tacked the preface to the end of his work, describe the character of the boors before they can be properly said to have commenced their travels.

" We left Hugo's on the 20th, and, after a ride of four hours, arrived at Tulbagh. The country through which we travelled this day, is overrun with the heath-like shrub called the *Rhinoster bosch*, (*Stoebe rhinocerotis*,) from under cover of which, we started numbers of Duyker antelopes, *Koorhaans*, (*Otis Afra*,) and *Kewits*, (*Charadrius coronatus.*) Within a mile of each other, and not far from Tulbagh, we crossed the sources of the Breede, and of the Little Berg Rivers; the former of which, running in an easterly direction, pours its waters into the Indian Ocean; while the latter, taking an opposite course, through the Reysand Kloof, joins the Great Berg River, and their united stream discharges itself into the Atlantic. The banks of the Breede River are garnished with a broad belt of the *Metrosideros angustifolia*, an elegant shrub, at this season in full flower.

" Respecting the village of Tulbagh, I have little to add to what I said on a former occasion. During the intervening period of nine years, no improvement whatever appears to have taken place. Every thing remains as it was, or is

silently undergoing that change for the worse, which time, when left to itself, usually operates on the works of man. So far as regards the most indispensable of all things, a command of water, the choice of situation has been peculiarly unfortunate. The only supply, for a great part of the year, is a scanty stream from the neighbouring mountain, conducted by an open channel, and exposed to constant pollution from all descriptions of cattle grazing in the adjoining fields; and from the pigs, ducks, and geese of the village, which pass their idle time in it, as it creeps along the street.

"We left Tulbagh at an early hour on the morning of the 23d, and crossing the mountain by a difficult path, called the Old Kloof, arrived, after a three hours' ride, at the farm of Mr. De Witt, on the Four-and-twenty Rivers. On our way thither, we passed another farm, the property of an Englishman of the name of Edwards. This person had been a missionary, sent from England to diffuse the new light among the Boschmen. A short sojourn among those savages appears, however, to have cooled his zeal, and given a carnal turn to his ideas. He returned to the Colony, married a woman of some property, and settled on this farm, where we found him collecting the produce of a vineyard that yields a more substantial return than methodism. He coolly asked us to walk into his house, but seemed nowise displeased when we declined the invitation.

"Not very long ago, an Englishman might travel over the whole Colony without incurring any expense for personal entertainment. Of late, the farmers have begun to make a trifling charge on this score, which, by removing the idea of obligation, renders travelling among them more pleasant than if their entertainment were gratuitous. It is to be feared, however, that this practice will endure but a short time. Englishmen are now settling in the country, and their numbers will speedily increase. Their national pride will not permit them to accept of indemnification from a traveller; and their Europæan habits will render them scrupulous of admitting him at all without a recommendation. From such a line of conduct, the boors will naturally conclude, that there must

be something disreputable in receiving strangers indiscriminately into their houses; and will conform to the practice of those whom they look up to as more enlightened than themselves. There is reason, therefore, to apprehend that the Colonists are in a fair way of forfeiting their claim to the only virtue that has not yet been grudged to them.

"After beating about the Four-and-twenty Rivers for several days to little purpose, we turned our face towards Capetown, where we arrived by the route of the Green Kloof and Zwartland, after an absence of about a month. With the exceptions already noticed, the weather was always dry and oppressively hot. In the room in which we slept at Tulbagh, the thermometer stood one day at 109°. A ride of fifty miles, exposed to the direct rays of such a sun, and to their more ardent reflection from a sandy road, without a breeze to fan us, but what was created by our own motion, such a ride we had from the Bavians Kloof to the Branaa Valley; from De Witt's to the Burgher's Drift; and from thence to Capetown. They must indeed be keen sportsmen whom a month of such weather, and a few rides of such length, would not satiate with the country amusements of the Cape. Our party flagged in their activity from day to day; and it was easy to perceive, that, long before our leave of absence had expired, a proposal to return home would have been eagerly embraced, if any of them had ventured to be the first to make it: but the point of honour kept them dumb.

"The country over which we travelled is the least interesting to an admirer of natural scenery that can be imagined: a remark which I feel no hesitation in extending to every part of the Colony that I have seen. No country in the world, perhaps, unites so much boldness of outline with such unvaried tameness of detail. This tameness, arising from the disposition of the surface, becomes the more fatiguing to the eye from the total want of wood. In the whole course of our travels, we did not see a single tree of nature's planting, nor a shrub much taller than one of ourselves. In the mountain ravines, you sometimes meet with stumps which show that trees of a considerable size did formerly grow there; but nothing

of that sort can be traced on the acclivities of the hills, or the interjacent plains. These seem to have always been as destitute of wood as they are now. The want of wood will be severely felt by the Colony ere long, as no trace of coal has yet been detected, nor, from the geological character of the country, is there any hope of its existence. Fuel is already among the most expensive articles of housekeeping in Capetown: I may venture indeed to say, that, in some of the most respectable families there, the diet costs less than the firewood required to dress it."

[*To be continued.*]

DESCRIPTION OF MALAYAN PLANTS,

By WILLIAM JACK.

No. II.

[*Continued from Vol. I. p.* 290.]

DIDYMOCARPUS. *Wall.*

Calyx 5-fidus. *Corolla* infundibuliformis, labio superiore brevi, inferiore 3-lobo. *Stamina* 5, nunc 4, quorum 2 vel 4 fertilia. *Capsula* siliquæformis, pseudo-4-locularis, bivalvis; dissepimenti contrarii lobi valvulis paralleli iisdemque æmuli, (ideoque fructum bicapsularem mentientes) margine involuto seminifero. *Semina* minuta, nuda, pendula.

Herbæ *villosæ, resinoso-glanduliferæ, aromaticæ.*

Genus *Bignoniaceis, Brown,* admissa *Incarvillea,* adsociandum, huicque proximum. *Wall.*

I am indebted for the above character of this hitherto unpublished genus to my esteemed friend Dr. Wallich, who has ascertained five species, natives of Nepaul; the four following have been since discovered in the Malay Islands.

DIDYMOCARPUS CRINITA. *W. J.*

Erecta, pilosa, foliis longis spathulatis acutis serratis subtus rubris, pedunculis 2–5 axillaribus unifloris basi cum petiolo coeuntibus, staminibus duobus fertilibus.

Timmi. *Malay.*—Native of the forests of Pulo Penang. —*Root* long and tapering. *Stem* short, erect, thick, rough beneath with the vestiges of fallen leaves. The whole plant is covered with hairs. *Leaves* alternate, crowded, subsessile, long, spathulate, nine or ten inches in length, acute, obtuse at the base, serrated, rugose, hairy, brownish-green above, purplish-red beneath; middle nerve strong and thick, forming a short petiole at the base. *Stipules* none. *Peduncles* 2–5 in each axil, one-flowered, round, two inches long, uniting at the base into a short, thick, unilateral rachis,

densely pilose and adhering beneath to the petiole. *Bracts* linear, 2, alternate on each peduncle. *Calyx* 5-parted, hairy, reddish, laciniæ erect, linear, acute, the upper one smaller. *Corolla* white, tinged with purple externally, much longer than the calyx, infundibuliform; tube somewhat gibbous at the base, incurved, expanding above; limb bilabiate; upper lip 2-lobed; lower 3-lobed, larger, internally streaked with yellow, all the segments roundish, obtuse, not very unequal. *Stamens* inserted within the tube, 2 fertile, with the rudiments of 2 abortive ones, the former scarcely so long as the corolla, conniving at their summits. *Anthers* composed of two divaricating, transverse lobes. *Ovarium* linear, surrounded at the base with a white, tubular, entire nectarial ring or cup, and produced into a tomentose *style* of the same length as the stamens. *Stigma* obtuse, truncate. *Capsule* long, linear, silique-shaped, cylindrical, acute, somewhat tomentose, an inch long, 2-valved, 2-celled; dissepiments contrary, with 2 lobes which are parallel to the valves, revolute, and seed-bearing at their margins, and which part the cells in such a manner, as to give the appearance of a 4-celled siliqua. *Seeds* numerous, naked, small, and subrotund.

Obs. The deep red colour of the lower surface of the leaves, and the crested disposition of the flowers in their axils, render this a very remarkable species. The æstivation is imbricate, the two lateral lobes of the lower lip being the outermost. The genus is nearly related to *Incarvillea*, but differs in having simple naked seeds.

DIDYMOCARPUS REPTANS. *W. J.*

Prostrata, reptans, foliis ellipticis crenulatis, pedunculis 1–3-axillaribus unifloris, staminibus duobus fertilibus.

Timmi. Kichil. *Malay.*—In the forests of Pulo Penang, with the preceding.—*Stem* prostrate, round, villous, striking root at every joint, often a foot in length. *Leaves* lying flat, opposite, petiolate, oblong-oval or elliptic, rather obtuse, sometimes slightly cordate at the base, slightly crenate, covered with white hairs, green above, paler and sometimes reddish beneath. *Petioles* villous. *Peduncles* 1–3, axillary,

1-flowered, erect, as long as the leaves, pilose, furnished with 2 bracts near the summit. *Calyx* 5-parted, with erect, acute laciniæ, the uppermost smaller. *Corolla* white, infundibuliform, bilabiate, similar to that of *D. crinita*, but smaller, as is the whole plant. *Stamens* 2 fertile, conniving above, 2 sterile. *Anthers* approximate, reniform, 2-celled. *Nectary* surrounding the base of the ovarium, obsoletely 5-toothed at the margin. *Style* equal to the stamens. *Stigma* simple. *Capsule* long, straight, silique-shaped, pseudo-4-locular, as in the genus. *Seeds* numerous, naked.

DIDYMOCARPUS CORNICULATA. *W. J.*

Erecta, foliis alternis obovatis acuminatis serratis, floribus diandris fasciculatis secundis super pedunculum axillarem elongatum.

Found at Tapanooly in Sumatra.—*Stem* nearly erect, 1–2 feet high, herbaceous or somewhat shrubby, villous. *Leaves* alternate, petiolate, obovate, acuminate, narrowing to the base, serrated, pilose above, villous below. *Peduncles* axillary, solitary, elongated, bearing several dense fascicles of flowers, all turned to one side, depressed, or bent at an angle to the peduncle, and spreading in a kind of half-circle, somewhat in the manner of *Lotus corniculatus*. *Flowers* many, white; pedicels articulate below the calyx, covered, as well as the calyx, with glandular hairs. *Bracts* linear, acute. *Calyx* 5-parted, segments linear. *Corolla* white, much longer than the calyx, infundibuliform, wide at the faux; limb somewhat oblique, bilabiate, the lower lip longer, 3-lobed. *Stamens* 2, connected above by their anthers, whose lobes are transverse. *Style* as long as the stamens. *Stigma* capitate. *Capsule* silique-shaped, 2-celled; cells bipartite, (as if 4-locular,) 2-valved, generally bursting at one side, many-seeded. *Seeds* naked.

The disposition of the flowers and fruit is peculiar; the capsules spreading horizontally, like radii, in a sort of semicircle, of which the peduncle is the axis.

DIDYMOCARPUS FRUTESCENS. *W. J.*

Caule suffrutescente erecto, foliis oppositis longe petiolatis ovato-lanceolatis acuminatis supra glabris subtus canescentibus, floribus axillaribus fasciculatis didynamis.

Native of Pulo Penang.—*Stem* generally simple, suffrutescent, densely covered with ferruginous appressed scales, or chaffy hairs. Leaves opposite, long-petioled, ovato-lanceolate, acuminate, attenuated to the base, slightly serrated, eight or ten inches long, smooth above, hoary and tomentose beneath, with appressed hairs. *Petioles* three inches long, furrowed above, thickened at the base, villous. *Stipules* none. *Peduncles* axillary, fascicled, 1–3-flowered, shorter than the petioles, purplish. *Bracts* lanceolate, acute. *Calyx* tomentose with glandular hairs, tubular, 5-parted, laciniæ linear, spreading above. *Corolla* white, tomentose without, like the calyx, much longer than it, infundibuliform, incurved; all the laciniæ subrotund, obtuse. *Stamens* 4, didynamous, arcuate, approximate at their summits, each pair connected by their anthers. The filaments of the upper pair are thickened below their middle. *Anthers* white, adnate to the filaments, consisting of two lobes nearly parallel. *Style* the length of the stamens. *Stigma* truncate. *Capsule* long, linear, silique-shaped, 2-valved, 2-celled, cells 2-parted by the septiform lobes of the dissepiments, which are revolute and seminiferous at their margins. *Seeds* numerous, naked.

SONERILA ERECTA.* *W. J.*

TETRANDRIA MONOGYNIA.

Erecta, ramosa, foliis lanceolatis serratis, racemis terminalibus paucifloris, floribus sessilibus.

Summow. *Malay.*—Native of the forests of Pulo Penang.—*Root* fibrous. *Stem* erect, six inches to a foot high, oppositely branched, round, tinged with red, fringed with two opposite longitudinal lines of hairs, (like that of *Veronica Chamædrys.*) *Leaves* opposite, petiolate, ovato-lanceolate, acute at both ends, serrated, villous, with erect hairs, 3-nerved, green

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* This genus belongs to the family of *Melastomaceæ.*

above, reddish beneath. *Petioles* nearly smooth. *Stipules* none. *Peduncles* terminal, springing from the centre of a 4-leaved verticil which terminates the branch, and of which two opposite leaves are smaller. The *spike* is unilateral, about 4-flowered, recurved, smooth; each flower sessile on the upper side of the clavate peduncle, which is there thickened, and, as it were, scooped out to receive it, and is attenuated downwards to the point of insertion into the branch. *Bracts* none, or very minute. *Calyx* smooth, trifid, laciniæ acute. *Corolla* of a light flesh colour, composed of 3 lanceolate, ovate, acuminate, spreading petals. *Stamens* 3, alternating with the petals, erect, scarcely so long as the corolla. *Anthers* 2-celled, acute, cordate at the base. *Style* erect, equal to the stamens. *Stigma* obtuse. *Ovarium* long, linear, inferior. *Capsule* oblong, obtusely 3-angled, 3-celled, 3-valved, many-seeded, the dissepiments opposite to the valves. *Seeds* attached to a central, columnar, 3-sided placenta.

Obs. This plant differs considerably in habit from the other species of *Sonerila*, in having an erect, slender, brachiate stem, and small lanceolate leaves, not oblique at the base as in most of the genus. The uppermost leaves are quaternate, forming a kind of involucre to the slender peduncle which springs from their centre.

SONERILA MOLUCCANA. *Roxb.*

Subcaulescens, villosa, foliis oblique cordatis integris oppositis altero minore, pedunculis axillaribus, racemis unilateralibus. *Roxb. Fl. Ind. v.* 1. *p.* 122.

Pouh. *Malay.*—Native of the moist shady forests of Pulo Penang.—A small herbaceous plant, whose *root* is fibrous, and whose *stem* does not exceed a few inches in length: every part is thickly covered with red hair. *Leaves* petiolate, opposite, one much smaller and rounder than the other, unequally cordate, acute, very entire, of a deep green on the upper surface, red beneath, with quintuple nerves. *Petioles* round and hairy. *Stipules* none. *Peduncles* generally from the axils of the smaller leaves, erect, bearing 1–3 unilateral, somewhat recurved, racemes, and furnished about the middle

with two small, opposite, bracteolar leaflets. The *racemes* are at first revolute, but unroll themselves as the flowers open. The *flowers* are unilateral, arranged in two rows upon short pedicels, each supported by a linear, ciliated *bract*. *Calyx* superior, covered, as is the rest of the plant, with red hairs, 3-parted, laciniæ lanceolate, acute. *Corolla* white, composed of three petals, inserted between the divisions of the calyx, ovate, acute, with a few red hairs along the middle of the under surface. *Stamens* 3, alternating with the petals. *Filaments* linear, ascending. *Anthers* linear, bending towards the style, yellow, 2-celled. *Style* declinate in an opposite direction to the stamens. *Stamens* simple. *Capsule* ovate, crowned by the calyx, hairy, 3-celled, 3-valved, many-seeded, the dissepiments opposite to the valves, the placentæ peltate, pedicellate, affixed to the axis of the capsule.

RHOPALA ATTENUATA. *W. J.*

TETRANDRIA MONOGYNIA.

Proteaceæ. Juss. & Br.

Foliis alternis ovatis acuminatis, racemis axillaribus foliis longioribus, pedicellis geminatis calycibusque glabris.

Native of Pulo Penang.—Arborescent, with round, smooth *branches*. *Leaves* alternate, petiolate, ovate, acuminate, attenuated to the base, and decurrent on the petiole, 10–11 inches long, entire, sometimes with one or two toothlets near the point, very smooth. *Petioles* short, thickened at the base. *Capsule* none. (?) *Spikes* rather longer than the leaves, axillary, cylindrical: flowers geminate, shortly pedicelled. *Perianth* 4-leaved, leaflets linear, dilated and staminiferous at the summit, revolute. *Stamens* 4, inserted near the apex of the perianth; *filaments* scarcely any; *anthers* linear, 2-celled. *Style* filiform, as long as the corolla; *stigma* clavate. *Ovarium* 1-celled, containing two erect *ovules*.

RHOPALA MOLUCCANA. *Br.*

Foliis alternis obovatis obtusiusculis integerrimis, racemis plerumque lateralibus, pedicellis bifidis calycibusque glabris.

Found in a garden at Pulo Penang.—Arborescent, with grey *bark*. *Leaves* alternate, petiolate, 6–7 inches long, obovate, (or cuneately ovate,) obtuse, very entire, very smooth, yellowish green. *Petioles* one inch long, flattened above, thickened at the base. *Spikes* lateral, generally below the leaves. *Flowers* geminate, on a bifid pedicel. *Bracts* very small. *Perianth* 4-leaved, leaflets revolute, dilated, and stamen-bearing at the summit. *Stamens* 4: *anthers* linear, nearly sessile. *Style* filiform. *Stigma* clavate. *Ovarium* 1-celled, dispermous.

Obs. In the preceding, the leaves are acuminate, and the flowers in pairs, each with its proper pedicel; in this, the leaves are rounded and obtuse at the apex, and the flowers are geminate on a common pedicel.

IXORA PENDULA. *W. J.*

Nat. Ord. Rubiaceæ.

Foliis elliptico-lanceolatis glaberrimis, corymbis longe pedunculatis pendulis.

Bunga yarum. *Malay.*—Native of Pulo Penang, &c.—A *shrub*, with smooth, compressed *branches*. *Leaves* opposite, shortly petioled, 11–12 inches long, elliptically lanceolate, rather obtuse, very entire, very smooth, shining above. *Petioles* little more than half an inch long. *Stipules* interpetiolar, broad at the base, ending in a subulate point. *Corymbs* terminal, long-peduncled, hanging, trichotomous, many-flowered. *Flowers* red. *Bracts* 2, small, at the base of the calyx. *Calyx* small, 4-partite, slightly tomentose. *Corolla* red: *tube* long and slender: *limb* 4-parted, lobes ovate, lanceolate, rather acute. *Stamens* spreading. *Style* filiform. *Stigma* clavate.

This is a beautiful species, at once distinguishable by its long pendulous corymbs. *Bunga yarum* is the generic Malay name of the *Ixoræ*.

EPITHINIA. *W. J.*

TETRANDRIA MONOGYNIA. Nat. Ord. RUBIACEÆ.

Calyx cylindricus, superus, 4-dentatus, persistens. *Corolla* tubulosa, limbo patente 4-partito, fauce villosa. *Stamina* exserta. *Stylus* exsertus. *Stigma* bifidum. *Bacca* sulcata, dipyrena, nucibus oblongis dispermis, semine uno super alterum.

EPITHINIA MALAYANA. *W. J.*

Found in mangrove swamps, on the Island of Singapore.—A moderate-sized *shrub*, with brown *bark* and smooth *branches*. *Leaves* opposite, petiolate, obovate, obtuse, rounded at the summit, attenuated at the base into the petiole, very entire, very smooth, almost without veins, shining above, paler beneath. *Petioles* none. *Peduncles* axillary, dichotomous, many-flowered, 1-flowered in the bifurcations. *Calyx* cylindrical, persistent, almost entire, or obsoletely 4-dentate. *Corolla* white; *tube* longer than the calyx; *limb* spreading, 4-parted, lobes ovate, rather acute; *faux* clothed with white hairs. *Stamens* 4, exserted, spreading, inserted alternately with the lobes of the corolla; *filaments* short; *anthers* linear, acute, dark-coloured. *Ovary* oblong, compressed, 2-celled; cells 2-seeded, the one placed over the other. *Style* exserted. *Stigma* bifid, with thick linear lobes. *Fruit* inferior, oblong, marked with 8 deep longitudinal furrows, crowned with the calyx, containing 2 long, narrow, oblong *nuts*, each with 2 *seeds*, one placed above the other: one of them is sometimes abortive.

OBS. I have not been able to refer this to any known tetrandrous genus: it comes nearest to *Malanea* of Aublet, but differs in several essential characters. The position of ths seeds is peculiar.

MORINDA TETRANDRA. *W. J.*

Nat. Ord. RUBIACEÆ.

Tetrandra, pedunculis umbellatis terminalibus, corollis quadrifidis intus hirsutis, foliis lanceolatis.

Padávara. *Rheed. Mal. v. 7. p.* 51. *t.* 27.—Mangkudu kichul. *Malay.*

Native of the Malay Islands.—A small, diffuse *shrub*, with long, slender *branches*, nodose at the bifurcations. *Leaves* opposite, shortly petioled, lanceolate, acuminate, very entire, very smooth, the nerves reddish below, and furnished with ciliated glands in the axils. *Stipules* interpetiolar, truncate. *Peduncles* 5–10, umbellate, terminal. *Flowers* aggregate on a common receptacle. *Calyx* an entire margin, crowning the ovary. *Corolla* infundibuliform, 4-parted, the laciniæ densely covered within with long white hairs. *Stamens* 4, shorter than the corolla, and alternating with its divisions: *filaments* very short: *anthers* oblong. *Ovary* inferior, 2-celled, 4-seeded. *Stigma* bifid. *Fruit* subglobose, yellow, composed of coadunate *berries*, angular by their mutual compression, crowned with the vestige of the calyx, 4-seeded: *seeds* osseous.

Obs. Rheede describes his *Padavara* to be fourteen feet high: this is the only particular in which it differs from my plant. In every other respect they agree exactly.

MORINDA POLYSPERMA. *W. J.*

Tetrandra, pedunculis axillaribus et terminalibus, corollis 4-fidis intus hirsutis, foliis ovatis acuminatis, baccis bilocularibus polyspermis!

Found on the Island of Singapore.—A *shrub*, with short, subdichotomous, flexuose *branches*. *Leaves* opposite, petiolate, ovate, acuminate, obtuse at the base, very entire, very smooth, coriaceous, flat, about three inches long. *Stipules* short, interpetiolar. *Peduncles* axillary and terminal; axillary ones opposite; terminal ones from 1–4, in a kind of umbel. *Capitula* few-flowered. *Calyx* an entire margin. *Corolla* infundibuliform, 4-parted, densely covered within with white hairs. *Stamens* 4, shorter than the corolla: *filaments* short: *anthers* linear. *Style* erect. *Stigma* bifid. *Berries* coadunate, 2-celled, many-seeded! *Seeds* numerous, angular.

Obs. The flowers of this species are perfectly similar to

those of the preceding, but the fruit presents a singular anomaly in being polyspermous. Both differ so much from the other species of *Morinda*, that I think they might properly constitute a new and distinct genus.

EUTHEMIS. *W. J.*

Pentandria Monogynia.

Calyx inferus, 5-phyllus. *Corolla* 5-petala. *Stamina* 5, hypogyna, antheris oblongis acuminatis apice poro dehiscentibus. *Stylus* filiformis staminibus æqualis. *Bacca* 5-sperma, seminibus circa axim dispositis, oblongis, intus angulatis, arillo fibroso inclusis, albuminosis, embryone inverso-cylindrico longitudine fere seminis, radicula supera.

Frutices, foliis alternis pulcherrime striatis nervis parallelis, racemis terminalibus, demum peracta floratione, lateralibus et oppositifoliis.

EUTHEMIS LEUCOCARPA. *W. J.*

Foliis lanceolatis pulchre spinuloso-serratis, racemis basi ramosis, baccis niveis globosis.

Plawan bruk. *Malay.*—Native of the forests of Singapore.—A *shrub* of uncommon elegance and beauty, erect, 4–5 feet high: branchlets round, smooth, sometimes slightly angled. *Leaves* alternate, petiolate, lanceolate, acute, decurrent on the petiole, spinuloso-serrate, very smooth and shining, beautifully striated with fine parallel nerves. *Petioles* margined, flat and channelled above, dilated at the base into a thick rounded prominent rim, which half embraces the stem. *Stipules* lanceolate, acuminate, ciliate, very deciduous. *Racemes* erect, with 1–2 branches near the base, at first terminal, afterwards lateral and oppositifolious, from the shooting up of the stem from the base of the peduncle. *Flowers* pedicellate, generally in pairs. *Bracts* ovate, acute. *Calyx* inferior, 5-leaved, spreading, leaflets ovate, obtuse, ciliate, the two inner ones rather smaller. *Corolla* white, sometimes tinged with purple, 5-petaled, petals twice as long as the calyx, reflexed, ovato-oblong, obtuse. *Stamens* 5, in-

serted below the ovary: alternating with these are sometimes found 5 short, abortive filaments. *Filaments* very short. *Anthers* longer, erect, conniving round the style, oblong, prolonged into acumina, which are sometimes a little contorted, and which open at their summits by a pore; the cells are adnate below to the sides of the filament. *Ovary* oblong, acute. *Style* filiform, erect, equal to the stamens. *Stigma* simple. *Berry* snow-white, globular, obscurely angled, crowned with the persistent *style*, which is obliquely deflexed; of a spongy or farinose substance, containing in the centre 5 *seeds*, dispersed round the axis, and enclosed in *arilli* composed of tough longitudinal fibres. *Seeds* (*pyrenæ?*) oblong, somewhat reniform, hard. *Albumen* conformed to the seed. *Embryo* inverse, cylindrical, nearly as long as the seed. *Cotyledons* semicylindrical, obtuse. *Radicle* superior, longer than the cotyledons.

The branches are terminated by long corniculate buds, in which the gemmation is involute.

EUTHEMIS MINOR. *W. J.*

Foliis angusto-lanceolatis leviter serrulatis, racemis simplicibus, baccis rubris angulatis acuminatis.

Found at Singapore with the preceding;—also on the Island of Penang. *Wall. in Roxb. Fl. Ind. v. 2. p.* 306.

A smaller *shrub* than the former, branched, smooth. *Leaves* alternate, petiolate, linear, lanceolate, rather obtuse with a mucro, attenuated to the petiole, slightly serrulate, very smooth, shining, finely striated with transverse veins. *Petioles* short, thickened at the base, channelled above. *Stipules* linear, ciliate. *Racemes* simple, erect, at first terminal, becoming afterwards lateral. *Flowers* alternate, pedicellate, often in pairs. There is a single leaf-like *bract*, and several smaller ones at the base of the pedicels, less deciduous than in the preceding. *Calyx* 5-leaved, leaflets ovate, ciliated. *Corolla* white, spreading, 5-petaled; *petals* lanceolate, acute. *Stamens* 5, erect, conniving, hypogynous: *filaments* very short: *anthers* yellow, oblong, broader at the base, 2-celled, cells adnate to the sides of the filament, prolonged above

into an acumen, opening at the top by a pore. *Ovary* oblong, acute. *Style* a little longer than the stamens. *Stigma* simple. *Berry* red, 5-angled, acuminate, composed of a whitish farinaceous pulp, and containing 5 *seeds*, each enveloped in a tough fibrous *arillus*, and in structure the same as the preceding.

CELASTRUS? BIVALVIS. *W. J.*

PENTANDRIA MONOGYNIA.

Foliis lanceolatis acuminatis integerrimis, pedunculis lateralibus paucifloris, corollis nullis, capsulis 2-valvibus monospermis.

A *shrub*, with smooth *branches*. *Leaves* opposite, petiolate, lanceolate, acuminate, acute at the base, very entire, very smooth. *Stipules* none. *Peduncles* lateral, divaricately dichotomous, few-flowered, (5–10-flowered.) *Bracts* small. *Calyx* 5-parted, bibracteate at the base, laciniæ roundish, imbricated. *Corolla* none. *Stamens* 5, erect, united beneath into a 5-toothed ring or urceolus: *filaments* flat: *anthers* oblong. *Style* erect, as long as the stamens. *Stigma* truncate. *Capsule* ovate, green, smooth, crowned with the style, 2-valved, 1-celled, 1-seeded: valves opening from the base, and falling off from the seed, which is more persistent, and remains on the peduncle. *Seed* ovate, contained in a beautiful crimson *arillus*, which is delicately veined. *Albumen* cartilaginous, conformed to the seed. *Embryo* erect, central, as long as the albumen. *Cotyledons* flat, foliaceous, ovate, obtuse. *Radicle* inferior, obverse to the umbilicus, much shorter than the cotyledons.

LEUCOPOGON (STYPHELIA) MALAYANUM. *W. J.*

PENTANDRIA MONOGYNIA. Nat. Ord. EPACRIDEÆ. *Br.*

Spicis axillaribus multifloris erectis brevibus, drupis globosis 5-locularibus, foliis lanceolatis mucronatis subenerviis subtus glaucescentibus.

Mintada. *Malay.*—Found abundantly at Singapore.—A small branching *shrub*, with hard dry leaves, exhibiting the

peculiar character of this family. *Leaves* alternate, sessile, lanceolate, acute, mucronate, very entire, very smooth, shining and convex above, somewhat glaucous below, and when examined by the microscope, appearing to be covered with numerous, very minute, white dots, firm, with scarcely perceptible longitudinal nerves. *Spikes* axillary, erect, much shorter than the leaves; peduncles somewhat tomentose. *Calyx* supported at the base by 2 oval, acute, concave *bracts*, 5-leaved, oblong, acute; leaflets lanceolate, glaucescent, ciliate. *Corolla* infundibuliform, a little longer than the calyx, 5-fid, puberulent, segments lanceolate, bearded above beyond the base. *Stamens* 5, short, alternate with the laciniæ. *Filaments* subulate. *Anthers* subpendulous, marked on each side with a longitudinal furrow, simple, and bursting longitudinally in the manner so accurately described by *Mr. R. Brown, Prodr. Fl. N. Holl. p.* 535. *Pollen* globose. *Ovary* surrounded at the base by five distinct, erect, obtuse scales, 5-celled, each cell containing a single, oblong *ovule*. *Style* erect, villous. *Stigma* subglobose. *Drupe* baccate, subglobose, 5-celled, cells 1-seeded.

Obs. The discovery of this species is remarkable, as forming an exception to the general geographical distribution of the *Epacrideæ*, a family almost exclusively confined to Australasia, or at least to the Southern hemisphere. Singapore, situated at the extremity of the Malay peninsula, and forming, as it were, the connecting link between Continental or Western India, and the Islands of the great Eastern Archipelago, partakes of this character in its Flora, which exhibits many remarkable points of coincidence with the Floras of both regions. I have had occasion to observe resemblances between its productions, and those of the Northern frontier of Bengal on one hand, and of the Moluccas on the other, while the present connects it with the still more distant range of New Holland.

RAUWOLFIA SUMATRANA. *W. J.*

Pentandria Monogynia. Nat. Ord. Apocyneæ.

Foliis ternis quaternisve elliptico-oblongis superne latioribus glabris, floribus terminalibus umbellatis, corollæ fauce villis clausa.

Tampal badak, or Simbu badak. *Malay.*—Frequent near Bencoolen.—It grows to a small *Tree*, having somewhat the habit and foliage of the *Mangga lant*, or *Cerbera Manghas.* The whole plant is lactescent. *Leaves* verticillate, generally in three, sometimes in four, shortly petioled, about six inches long, elliptic-oblong, broader above, and terminating in a short point, very entire, very smooth, rather firm, and having nearly transverse nerves. *Peduncles* 3–4, umbellate, terminal, long, round and smooth, bearing compound *umbels* of small white *flowers.* *Calyx* small, 5-lobed. *Corolla* white; *tube* longer than the calyx; *limb* spreading, 5-parted, lobes subrotund; *faux* closed with white hairs, which appear to form five tufts. *Stamens* 5, included; *filaments* very short; *anthers* yellow, sagittate, acute, conniving over the stigma. *Ovary* furrowed on both sides, 2-celled, tetrasporous, surrounded by an obscurely 5-lobed nectarial ring. *Styles* 2, united together. *Stigma* peltate, capitate, glutinous, papillose. *Berry* globose, smooth, containing two *nuts*, which are compressed, rugose, gibbous, and tapering towards the top, subunilocular with an imperfect dissepiment, generally 1-seeded. *Seed* compressed.

Obs. This species appears to have considerable resemblance to *Rauwolfia nitida*, but is sufficiently distinguished by its inflorescence. The wood of the tree is very light, and employed by the Sumatrans for the scabbards of their swords and kreesses.

TACCA CRISTATA. *W. J.*

Foliis indivisis lato-lanceolatis, involucro diphyllo, umbella secunda cernua superne intra involucrum foliolis duobus involucro duplo longioribus stipata.

Native of Singapore and Pulo Penang.—*Root* thick and

tuberous, sending out a number of fibres. *Leaves* nearly two feet long, numerous, radical, erect, petiolate, ovato-lanceolate, acute, entire, smooth. *Petioles* sheathing at the base. *Scape* erect, round, nearly as long as the leaves, striated, smooth. *Flowers* peduncled, all drooping to one side; *peduncles* subumbellate, arranged transversely in two parallel rows, and uniting into a kind of crest, from which proceed ten long, pendulous filaments. *Involucre* 2-leaved; leaflets ovate, acute, broad at the base, nervose, purplish, twice as long as the peduncles, the upper one erect, the lower reflexed and bent down by the drooping flowers. From within the upper leaflet of the involucre spring two erect folioles, which are twice as long as the involucre, obovate, attenuated below into straight, flat, deep-purple, petiolar ungues, acute at the apex, pale-coloured, with purplish nerves. *Perianth* superior, of a dark purple colour, campanulate and somewhat ventricose, rather contracted and three-cornered at the mouth, where it is also striated; *limb* 6-parted, somewhat reflexed; laciniæ hyaline, oblong, broad, obtuse, the three interior ones larger. *Corolla* none. *Stamens* 6, in the bottom of the perianth, and opposite to the laciniæ. *Filaments* broad at the base, arching upwards into a vaulted cucullus, within which the anthers are concealed. *Anthers* adnate, 2-lobed. *Style* thick, shorter than the stamens, with six prominent angles. *Stigma* flat, umbilicate, orbicular, 6-rayed, 3 alternate sinuses deeper. *Berry* ovate, 6-angled, 1-celled; *seeds* numerous, attached to three parietal receptacles.

Obs. This approaches to *T. integrifolia, Curt. Bot. Mag. t.* 1488; but is a much larger plant, and abundantly distinguished by the 2-leaved involucre, the long erect leaflets within it, and the flowers drooping to one side.

VERATRUM? MALAYANUM. *W. J.*

Foliis radicalibus lanceolatis, scapis erectis verticillato-paniculatis, baccis trilocularibus.

Native of Pulo Penang.—An erect, herbaceous plant. *Leaves* radical, 3–4 feet long, petiolate, lanceolate, acuminate,

attenuated into a petiole at the base, very entire, tomentose, striated with parallel nerves, which run nearly longitudinally, but diverge from a central one. *Petioles* canaliculate, obtusely carinate, sheathing at the base. *Scape* erect, round, tomentose, verticillately panicled. *Peduncles* alternately semiverticillate, divaricate, and spreading. *Flowers* sessile: on hermaphrodite or male plants fascicled, on female ones solitary. Beneath each semiverticil is a large floral leaf, which is ovate, acute, and contracted at the base into a flat, straight, petiole-like unguis which embraces the stem. *Perianth* 6-parted; the 3 inner laciniæ petaliform, white, spreading. *Stamens* 6: *filaments* flat, dilated at the base. *Styles* 3, short. *Stigmas* 3. In the female plant, the calyx embraces a globular *berry* which is 3-celled, each cell 1-seeded.

Obs. The true place of this plant is somewhat ambiguous, and I am doubtful whether it can be admitted as a genuine species of *Veratrum*. It does not, however, agree exactly with any other genus of the same family; in habit it is somewhat like *Alisma*.

MEMECYLON CÆRULEUM. *W. J.*

Octandria Monogynia.

Foliis cordatis amplexicaulibus, pedunculis axillaribus brevibus, pedicellis oppositis divaricatis brevibus, fructibus ovatis.

Kulit nipees. *Malay.*—Native of Pulo Penang.—A handsome *shrub*, 10–12 feet high, with round, smooth branches. *Leaves* opposite, subsessile, about five inches long, cordate, amplexicaul, oblong, acute, very entire, margin reflexed, coriaceous, very smooth, deep green and shining above, lateral nerves inconspicuous, uniting at their extremities into a line which runs parallel to the margin. *Stipules* none. *Peduncles* axillary, solitary, short, few-flowered: *pedicels* short and thick, opposite, somewhat verticillate, divaricate, forming a kind of corymbiform head. *Flowers* blue; *bracts* opposite, short, acute. *Calyx* superior, coloured, smooth, nearly entire, becoming, by age, more distinctly 4-toothed. *Corolla* deep blue, 4-petaled, spreading; *petals* broad, ovate,

acute. *Stamens* 8, erect, shorter than the corolla. *Filaments* short. *Anthers* blue, attached by their middle, horizontal, shaped somewhat like the head of an axe, with a knob behind; cells parallel on the anterior edge. Before expansion, the anthers are bent downwards, (somewhat in the manner of the *Melastomæ*,) and the surface of the germen and bottom of the calyx are marked with their impressions, of which the four inner are the deepest; the ridges between them form eight sharp, prominent rays, and there are eight other less conspicuous lines, formed by the faces of the bilocular anthers. *Ovary* ovate, 1-celled, containing 6–8 erect *ovules*. *Style* filiform, a little longer than the stamens. *Stigma* acute. *Berry* cortical, crowned by the persistent calyx, ovate, a little oblique at the base, 1-seeded, the rudiments of the abortive ovules surrounding the umbilicus. *Seed* ovate, umbilicate at the base and a little oblique. *Albumen* none. *Embryo* erect. *Cotyledons* membranaceous, contortuplicate. *Radicle* cylindrical, nearly as long as the seed, obverse to the umbilicus.

Obs. The different species of *Memecylon* have not been well defined by authors: this appears to differ from *M. cordatum*, Lamarck, and *M. grande*, Retz, or *Nedum schetti*, *Rheed. Mal. v.* 2. *p.* 21. *t.* 15, in having ovate, not globose, fruit, and in the flowers not being umbelled. In the latter, the flowers are small, yellow, and numerous; in this, they are larger, blue, and much fewer in number.

LAURUS PARTHENOXYLON.* *W. J.*

Enneandria Monogynia.

Foliis venosis ovatis acutis petiolatis subtus glaucis, paniculis brevibus paucifloris axillaribus et lateralibus, fructu globoso calyci truncato insidente.

Kayo Gadis. *Malay.*—Abundant in the forests of Sumatra.—A lofty timber *tree*. *Bark* brown and rough. *Leaves*

* "For an account of a nearly-allied species, see a paper of Dr. Wallich, on the Nipal Camphor and Sassafras Tree, (*Laurus glandulifera*, *Wall.*,) in the Transactions of the Medical and Physical Society of Calcutta, vol. 1."

alternate, rather long-petioled, ovate, acute, often acuminate and varying in breadth, about three inches long, entire, with somewhat revolute edges, smooth, glaucous beneath, nerves lateral and irregularly alternate. *Petioles* round, an inch long. *Peduncles* from the young shoots at the extremity of the branches, axillary or lateral, terminated by a short, few-flowered *panicle*, and generally longer than the young leaves from whose axils they spring. *Bracts* none. *Perianth* funnel-shaped, 6-parted, yellowish. *Stamens* 9, arranged in two rows, the outer six naked, the inner three furnished at the base with two yellow glands: *filaments* flat: *anthers* adnate, the cells opening with a longitudinal valve or operculum. *Style* as long as the stamens. *Stigma* obtuse, 4-cornered. *Drupe* seated on the enlarged cup-shaped persistent truncated base of the perianth, globose, containing a 1-seeded *nut*. *Embryo* inverse. *Cotyledons* hemisphærical. *Radicle* superior, within the edge of the cotyledons.

Obs. This species has considerable affinity to *L. cupularia*. The fruit has a strong balsamic smell, and yields an oil, which is considered useful in rheumatic affections, and has the same balsamic odour as the fruit itself. An infusion of the root is drunk in the same manner as Sassafras, which it appears to resemble in its qualities. The wood is strong and durable when not exposed to wet, and in that case considered equal to *Teak*. *Kayo Gadis* signifies the *Virgin Tree*, whence the specific name.

May this not be the *Oriental Sassafras Wood*, mentioned under the article *Laurus* in Rees' Cyclopædia?

GOMPHIA * SUMATRANA. *W. J.*

Decandria Monogynia. Nat. Ord. Ochnaceæ.

Foliis lanceolatis vel oblongo-ovalibus acuminatis obtuse denticulatis nitidis sub 5-nerviis, stipulis intrapetiolaribus deciduis, paniculis terminalibus.

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* "I strongly suspect that the plant which I have described in Roxburgh's *Fl. Ind. v.* 2. *p.* 305, under the name of *Euthemis elegantissima*, is a species of *Gomphia*. Can it be possibly the luxuriant shoots of Jack's species? Its leaves are, without exception, the most beautiful I have ever met with."—*N. W.*, 1830.

Sibooru. *Malay.*—Sumatra.—A large *shrub* or small *tree*. *Leaves* alternate, shortly petioled, eight or nine inches long, from lanceolate to oblong-oval, varying considerably in breadth, from 2–3 inches, acuminate, acute at the base, obtusely denticulate, very smooth, shining, middle nerve very strong, lateral veins numerous, transverse, somewhat reticulated, delicate, uniting near each margin into two nerves, which run parallel to it almost the whole length, and give the leaf the appearance of being 5-nerved. *Petioles* very short. *Stipules* interpetiolar, broad at the base, acuminate, deciduous. *Panicles* terminal, not much branched; pedicels slender, rarely solitary, surrounded at their bases by small acute *bracts*. *Calyx* 5-leaved, persistent; leaflets ovate, acute, smooth, lucid. *Corolla* yellow, 5-petaled, scarcely longer than the calyx. *Stamens* 10; *filaments* very short; *anthers* long, linear, opening at the top by two pores. *Style* as long as the stamens. *Stigma* acute. *Ovaries* 5, surrounding the base of the style, and elevated on a receptacle. This *receptacle* enlarges as the fruit ripens. The number of abortive ovaries is variable; sometimes only one comes to perfection. The *berries* are drupaceous, obliquely reniform, somewhat compressed, 1-seeded. *Seed* exalbuminous.

Obs. This appears to have so much resemblance to the *G. Malabarica, DeC.;* (Pua Tsjetti *Rheed. Mal. p.* 103. *t.* 52,) that I have some hesitation in proposing it as a distinct species. The points of difference are the following:—the leaves of this are much longer than those of the Malabar species, which are described as almost veinless, while in this, the transverse veins unite into two very distinct marginal nerves, which it is difficult to suppose could have escaped observation, had they existed in the other. The representation of the inflorescence in Rheede's figure is unintelligible, and his description of it is not much clearer, but as far as it can be made out, it appears different from this. Further examination of the Malabar plant will be necessary to determine whether this is really distinct, and whether the differences above noticed exist in the plant itself, or are mere omissions in the description.

MURRAYA PANICULATA.

DECANDRIA MONOGYNIA. Nat. Ord. AURANTIÆ.

Foliolis ovatis acuminatis, floribus terminalibus axillaribusque subsolitariis, baccis oblongis sæpius dispermis.

Chalcas paniculata, *Lour. Fl. Coch. p.* 270.—Camunium, *Rumph. Amb. v.* 5. *p.* 26. *t.* 17.—Kamuning. *Malay.*—This is an abundantly distinct species from *M. exotica*, though unaccountably confounded with it by later authors. Loureiro discriminates between them very well, and his description is on the whole good. Rumphius' figure is bad, but preserves several of the distinguishing characters; particularly in the inflorescence and leaves, which, however, are not sufficiently acuminate. It grows to the size of a small *tree*, and the *wood* is much employed for the handles of kreesses, being capable of receiving a fine polish. The *leaflets* are generally five, ovate, terminating in a long acumen, which is slightly emarginate at the point, shining, and very entire, the terminal one considerably the largest. In *M. exotica*, the leaflets are more numerous and closer, obovate, blunt, and of a much firmer, thicker substance. The *flowers* of *M. paniculata* are fewer and larger than those of *M. exotica*, and are sometimes terminal, generally one or two together from the axils of the upper leaves. *Ovary* 2-celled: *berries* oblong, reddish, and mostly containing 2 *seeds*, which are covered with silky hairs. The berries of *M. exotica* are ovate, and generally 1-seeded. The specific name *paniculata* is objectionable, as the flowers are much less panicled than in the other species.

The *Camunium sinense, Rumph. v.* 5. *t.* 18. *f.* 1, which is commonly met with in gardens throughout the Malay Islands, is quite a distinct genus from the other two *Camuniums*, and has been described by Loureiro, *Fl. Cochinch, v.* 1. *p.* 173, under the name of

AGLAIA ODORATA.

This has a 5-parted inferior *calyx*, and 5-petaled *corolla*. *Stamens* 5, and inserted, in the manner of the *Meliaceæ*, on the inside of an ovate nectarial tube, which is contracted at

the mouth, and conceals the *anthers.* The *stigma* is large, sessile, simple as far as I have observed, not double, as stated by Loureiro. The *ovary* appears to be 1-celled, and to contain two pendulous *ovules.* It rarely ripens its fruit in these Islands; but, according to Loureiro, it bears a small, red, 1-seeded *berry. Flowers* very small, yellow, and fragrant, in small axillary *panicles.*

In the catalogue of the *Hortus Benghalensis, p.* 18, this plant is specified under the name of *Camunium sinense,* after Rumphius. The *Murraya paniculata* above described is the true *Kamuning* of the Malays, and the name *C. sinense* is only applied by Rumphius, in the manner of the older botanical authors, as one of comparison and resemblance, for want of a better of native origin; if, therefore, the generic name *Camunium* is to be adopted at all, it ought to be applied to the plant to which it really belongs, and cannot be admitted for one of a different family, not indigenous to the Malay Islands. On this account, Loureiro's name is to be preferred.

RHIZOPHORA CARYOPHYLLOIDES. *W. J.*

DODECANDRIA MONOGYNIA.

Fruticosa, foliis ovato-lanceolatis utrinque acutis, pedunculis axillaribus 3-floris, rarius dichotome 5-floris, floribus 8-fidis, radicula subcylindrica acutiuscula.

Mangium Caryophylloides, *Rumph. Amb. v.* 3. *p.* 119. *t.* 78.—Found at Singapore and Pulo Penang.—A *shrub,* much smaller than the common *Mangrove,* and with less divided *roots.* Generally found in shallow sandy salt-marshes, rising with a tolerably erect *stem,* and branched nearer to the base than the common species. *Leaves* opposite, petiolate, about four inches long, oval or ovate, lanceolate, acute at both ends, sometimes slightly inequilateral, very entire and smooth, coriaceous; the lower surface appearing, under the lens, dotted with minute white points. *Petioles* round, furrowed above, smooth. *Stipules* long, enveloping the corniculate *buds* in the manner of a *Ficus,* very deciduous. *Peduncles* axillary, solitary, 3-flowered, shorter than the petioles;

sometimes dichotomously 5-flowered, having a *flower* in the bifurcation. *Calyx* semi-inferior, surrounding the ovary, ovate; *limb* 8-parted, spreading; *laciniæ* linear, acute, thick, rather incurved at their points. *Corolla* white, 8-petaled: *petals* nearly erect, alternate with the laciniæ of the calyx, conduplicate, inclosing the stamens by pairs, bifid, furnished with a few threads or filaments at the point, ciliated on the margin. *Stamens* double the number of the petals, inserted on the calyx in a double series, the inner ones shorter, erect, not so long as the petals, enfolded by them until the period of complete expansion, when they burst from their recesses with elastic force, and disperse their pollen. *Anthers* linear, acute, 2-celled. *Ovary* contained within the calyx, 2-celled, tetrasporous: *ovules* subrotund, affixed near the top of the cells. *Style* filiform, as long as the stamens. *Stigma* bifid with acute laciniæ. *Fruit* contained in the persistent calyx, 1-seeded, the other 3 ovules proving abortive. *Seed* at first ovate or roundish, with conform *albumen*: the *embryo* inverse, in the upper part of the seed. As the fruit advances, the *radicle* is elongated, and becomes at length nearly cylindrical, obsoletely angled and rather acute at the point. I have generally found 3 *cotyledons*, rarely 4.

Obs. Rumphius' figure is by no means a good representation of the plant, but his description of it is correct. It comes nearest to the *R. cylindrica*, (Kari Kandel, *Rheed. Mal. v.* 6. *p.* 59. *t.* 33,) which differs from this in having the radicle very obtuse, and more exactly cylindrical, and the peduncles generally 1 or 2-flowered. According to Rumphius, this species is rather rare, and is called *Mangi Mangi Chenke*, or *Clove Mangrove*, whence his appellation *caryophylloides*, which I have thought proper to retain, as the resemblance holds good in some particulars.

ACROTREMA. *W. J.*

Dodecandria Trigynia.

Calyx pentaphyllus. *Corolla* 5-petala, patens. *Stamina* 15, erecta, *filamentis* brevibus, *antheris* longis, linearibus, apice biporis. *Ovaria* 3, distincta, 2-spora, ovulis angulo

interiori affixis. *Styli* 3. *Stigmata* simplicia. *Capsulæ* uniloculares.

Herba acaulis, pilosa, pedunculis racemoso-multifloris.

Genus Saxifrageis affine, numero partium inusitato distincto.

ACROTREMA COSTATUM. *W. J.*

On hills, and among rocks, at Pulo Penang.—*Root* tapering, sending out a few fibres. *Stem* scarcely any. *Leaves* alternate, spreading, shortly petioled, 6 inches long, oblong-obovate, obtuse, sagittate at the base, dentato-serrate, somewhat ciliated, pilose, furnished with a short tomentum, and also with more remote, longer, appressed hairs, the nerves very hairy, parallel, and terminating in the denticulæ of the margin. *Petioles* short, sheathing; their margins dilated into membranaceous auricles, which might be considered as adnate stipules. *Peduncles,* or *scapes,* central, erect, 3–6 inches high, pilose, recurved at the summit, 8–10-flowered. *Flowers* yellow, pedicellate, racemose. *Calyx* 5-leaved, pilose, leaflets ovate, acute. *Corolla* yellow, spreading, 5-petaled; *petals* broader above, lanceolate. *Stamens* 15, erect, hypogynous: *filaments* very short. *Anthers* very long, linear, 2-celled, opening by 2 pores at the top. *Ovaries* 3, distinct, superior, 1-celled, 2-seeded, each bearing one *style* of the height of the stamens. *Ovules* attached to the inner angles. *Stigmas* simple. *Capsules* 3.

Obs. I am at a loss to determine the exact affinities of this plant: it has the habit of the *Saxifrageæ*, but the number of both the male and female parts of fructification is greater by one-third, and the ovaries are distinct.

LAGERSTRŒMIA FLORIBUNDA. *W. J.*

Icosandria Monogynia.

Foliis suboppositis ovato-oblongis glabris, paniculis terminalibus ramosissimis multifloris ferrugineo-villosis, staminibus inæqualibus, calycibus turbinatis sulcatis.

Found at Pulo Penang.—A *tree*. *Leaves* subopposite, short-petioled, rather recurved, 7–8 inches long, ovato-oblong, somewhat acute, entire, smooth, with strong prominent nerves,

and reticulate veins. *Panicle* terminal, much-branched, spreading, many-flowered. *Peduncles, pedicels,* and *calyces* ferruginous, densely villous with stellated hairs. The *flowers* smaller than those of *L. Reginæ,* but more numerous, and in much larger panicles, pale rose-coloured on first expansion, and passing through various gradations of intensity till they become at last nearly purple. *Calyx* covered with ferruginous wool, turbinate, regularly marked with many deep longitudinal furrows or ribs, giving it a fluted appearance; *limb* spreading, 6-parted. Before expansion, the calyx is obconical, and nearly flat at top. *Corolla* 6-petaled, spreading; *petals* inserted by short ungues alternately with the segments of the calyx, ovate, not much undulated. *Stamens* red, numerous, inserted on the calyx, 6 longer, thicker and more conspicuous than the rest. *Ovary* thickly clothed with white hair, 6-celled, many-seeded. *Style* erect. *Stigma* clavate.

Obs. This beautiful and splendid species may be readily known from *L. Reginæ* by the greater size of its panicles and their ferruginous colour. The flower-buds in that species represent somewhat a double cone, in this a single inverted cone, being flat and even depressed at top. *L. hirsuta, Lam.* is also quite distinct, having hirsute leaves.

TERNSTRŒMIA RUBIGINOSA. *W. J.*

Polyandria Monogynia.

Foliis ovatis spinuloso-serratis subtus incanis, floribus lateralibus et axillaribus fasciculatis monadelphis, pedunculis calycibusque glanduloso-pilosis, fructu triloculari.

S'eengo, eengo. *Malay.*—Hab. Sumatra.—A *tree. Branches* cinereous, young parts covered with acute scales. *Leaves* alternate, petiolate, ovate, acuminate, spinuloso-serrate, smooth above, hoary and white beneath, the nerves furnished with ferruginous paleaceous scales. *Flowers* in fascicles, lateral and axillary. *Peduncles* and *calyces* covered with glandular hairs. *Bracts* small, about the middle of the peduncles. *Calyx* 5-parted. *Corolla* white, campanulate, rotate, 5-parted, divided about half way down. *Stamens* numerous; *filaments* short, united at the base into a ring,

which is inserted on the bottom of the corolla; *anthers* oblong, recurved, affixed by the middle, 2-celled, opening at the top by 2 oblique pores. *Ovary* acute, ovate, covered with glandular hairs, 3-celled, polyspermous; *placentæ* central. *Style* 3-fid, divided to the base. *Stigmas* simple.

TERNSTRŒMIA PENTAPETALA. *W. J.*

Foliis obovato-lanceolatis spinuloso-denticulatis glabris, floribus lateralibus fasciculatis, pedunculis glabris, fructu triloculari.

Native of Pulo Penang.—A *shrub*, with grey *bark*, and leafy at the summit. *Leaves* alternate, petiolate, 10–12 inches long, obovato-lanceolate, acuminate, spinuloso-denticulate, smooth: the nerves furnished with a few appressed, innocuous, scale-like spines. *Petioles* about an inch long, covered, as well as the summits of the branches and buds, with small ferruginous scales. *Flowers* in fascicles below the leaves, from the axils of the fallen ones of the preceding year: they are pedicellate and white. *Calyx* coloured, 5-leaved, the 2 outer leaflets smaller. *Corolla* white, 5-petaled; *petals* subrotund, a little longer than the calyx. *Stamens* numerous, distinct, inserted on the base of the petals; *filaments* short; *anthers* oblong, yellowish-white, didymous, truncate at the top, and there opening by 2 pores. *Ovary* ovate, 3-celled, many-seeded; *placentæ* from the inner angles of the cells. *Style* deeply 3-fid. (*Styles* 3?) *Stigmas* 3.

I have not seen the ripe fruit of this, but have been informed that it produces a white berry.

ELÆOCARPUS NITIDA. *W. J.*

Polyandria Monogynia.

Foliis ovato-lanceolatis serratis, racemis axillaribus, foliis brevioribus, staminibus 15, nuce 5-loculari, loculis plerumque 4 abortivis.

Bua Manik. *Malay.*—Native of Pulo Penang.—A *tree*, of moderate size, with grey *bark*, and round, smooth *branches*. *Leaves* alternate, petiolate, 3–4 inches long, ovato-lanceolate, acuminate, obtusely serrated, attenuated to the base, very smooth. *Stipules* none. *Racemes* simple, axillary, secund,

shorter than the leaves. *Flowers* white, shortly pedicelled. *Calyx* deeply 5-parted; *laciniæ* linear, acute. *Corolla* 5-petaled, fimbriated at the summit. *Nectary* of 5 yellow retuse glands, surrounding the ovary. *Stamens* 15, erect, 10 are inserted by pairs between the glands of the nectary, the remaining 5 between those glands and the ovary. *Anthers* linear, bilamellate at the summit. *Style* as long as the calyx. *Stigma* simple. *Drupe* globose, containing a 5-celled *nut*, which is rugose, and marked with 5 obtuse longitudinal ridges; in general only 1 cell is fertile, and contains a single seed. *Seed* furnished with *albumen: embryo* inverse, with flat *cotyledons* and superior *radicle.*

Obs. This may, perhaps, be one of the smaller varieties of *Ganitrus* mentioned by Rumphius: it differs from *E. Ganitrus* of Roxburgh, who quotes Rumphius, *v.* 3. *t.* 10, in the number of the *stamens*, the position of the *racemes*, and the number of fertile *cells* in the *nut.* Compare *Adenoda sylvestris*, Loureiro, *Fl. Cochin.* which agrees in the number of its *stamens.* I suspect Gærtner must have fallen into an error in representing the *embryo* erect in his *Ganitrus;* in this it is certainly inverse.

MONOCERA.* *W. J.*

Elæocarpi Species.

Calyx 5-phyllus. *Corolla* 5-petala, petalis apice laciniatis, sæpe sericeis. *Stamina* plura, antheris apice dehiscentibus, unicornibus, valvula altera majore. *Ovarium* basi glandulis cinctum, biloculare, polysporum. *Drupe* nuce 1–2-sperma.

This genus, whose characters appear sufficiently distinct, will include, besides the following new species, several hitherto referred to *Elæocarpus*, viz. *E. Monocera*, (Cavanilles,) the separation of which has already been suggested, and of which the specific name may be appropriately adopted for the genus; *E. rugosus*, *E. aristatus*, and *E. bilocularis* of Roxburgh; probably also *E. grandiflora*, and *E. reticulata* (Sir J. E.

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* "See R. Brown's *Prodromus*—under *Velleia, v.* 1. *p.* 580."

Smith in *Rees' Cycl.*) The *E. dentata*, (*Dicera dentata, Forst.*) may also belong to this, if, as remarked by Sir J. E. Smith, (*Rees' Cycl. in loco*,) the anthers have only one of their valves awned, not both equal, as originally stated by Forster. His capsule may perhaps be only the ovary, which will then agree with the present genus.

MONOCERA PETIOLATA. *W. J.*

Foliis longe petiolatis ovato-lanceolatis integris glabris, racemis axillaribus, foliis brevioribus, petalis medio intus incrassatis villosis.

Native of Pulo Penang.—A lofty *tree.* *Leaves* petiolate, alternate or scattered, 8–9 inches long, exclusive of the petiole, ovato-lanceolate, generally obtusely acuminate, entire, very smooth, deep green, and shining above, with lucid nerves and veins, which are destitute of glands. *Petioles* 4 inches long, smooth, thickened at the base and summit. *Racemes* axillary, as long as the petioles: *flowers* pedicellate, turning one way. *Calyx* white, 5-leaved, leaflets lanceolate-acuminate. *Corolla* white, 5-petaled, as long as the calyx; *petals* ovato-lanceolate, fringed at the point, sericeous without, thickened along the middle, and covered with white hairs within, margins inflexed: 10 thick subrotund yellow *glands* surround the stamens. *Stamens* numerous, (25–30,) inserted within the glands, erect, shorter than the petals: *filaments* short; *anthers* longer, linear, bivalved at the apex, the outer valve elongated, the inner short and acute. *Style* filiform, longer than the stamens. *Stigma* acute. *Ovary* ovate, 2-celled, many-seeded. *Drupe* ovate, containing a smooth, 1-celled, 1–2-seeded *nut.*

MONOCERA FERRUGINEA. *W. J.*

Foliis oblongo-ovatis acuminatis integris subtus cum pedunculis ramulisque ferrugineo-villosis, racemis axillaribus foliis brevioribus.

Found at Singapore.—A *tree.* *Branchlets* rusty and villous. *Leaves* irregularly alternate, petiolate, oblong-ovate, acuminate, 6–7 inches long, entire, with revolute edges, smooth above, ferruginously villous below, nerves without

glands. *Petioles* 2–2½ inches long, villous and ferruginous, thickened under the leaf. *Racemes* axillary, shorter than the leaves. *Flowers* pedicelled. *Peduncles* and pedicels ferruginous. *Drupe* oval, the form of an *Olive*, but smaller, with a single, rather smooth *nut*, generally containing but one perfect seed; sometimes there is a second, smaller, and the vestiges of the partition and abortive *ovule* can almost always be observed. *Seed* oblong, pointed above. *Albumen* conform: *Embryo* inverse, extending nearly the whole length of the albumen. *Cotyledons* flat, oblong, with a distinct nerve along their middle. *Radicle* superior, clavato-cylindrical, much shorter than the *cotyledons*.

Obs. I have not seen the flowers of this species, but its fruit and general resemblance to the preceding, leave no doubt as to the genus, and its characters are sufficiently marked to distinguish it from the others.

TETRACERA ARBORESCENS. *W. J.*

POLYANDRIA TETRAGYNIA.

Foliis obovatis integerrimis glabris, floribus paniculatis axillaribus et terminalibus, calycibus 5-phyllis.

Near the shores of the Bay of Tapanooly in Sumatra.—Arborescent. *Leaves* alternate, petioled, about 3 inches long, oblong-obovate, rounded at the apex, and terminating in a short point, very entire, with reflexed edges, smooth, shining above, coriaceous and firm, veins reticulate, *nerves* somewhat pilose on the under surface. *Petioles* short. *Panicles* axillary and terminal, many-flowered. *Calyx* 5-leaved, spreading, persistent, smooth. *Stamens* numerous. *Capsules* generally 3, smooth and shining, roundish-ovate, opening on one side, containing a single *seed* attached to the base of the capsule, and enveloped in a pale yellowish laciniate *arillus*. The vestiges of 2 or 3 abortive *ovules* are observable in the bottom of the capsule.

UVARIA HIRSUTA. *W. J.*

POLYANDRIA POLYGYNIA.

Tota hirsuta etiam calyces fructusque pilis erectis, floribus

subsolitariis, petalis patentibus subæqualibus, foliis ovato-oblongis basi cordatis.

Pulo Penang.—The whole plant is hirsute, with long erect hairs. *Branches* round. *Leaves* alternate, short-petioled, ovato-oblong, acuminate, cordate at the base, entire, simply pilose above, hirsute beneath, with stellate fasciculated hairs. *Flowers* lateral, almost solitary, shortly peduncled. *Bracts* lanceolate, acute. *Calyx* hairy, as well as the peduncles and bracts, bursting irregularly, often into two segments. *Corolla* of a deep red colour, 6-petaled: *petals* spreading, lanceolate, acute. *Stamens* numerous, with long linear *anthers*. *Germens* numerous; *styles* and *stigmas* the same. *Berries* numerous, long-pedicelled, oblong, hirsute, with ferruginous hairs, many-seeded. *Seeds* arranged in a double longitudinal series.

CAREYA MACROSTACHYA. *W. J.*

Monadelphia Polyandria.

Arbor, foliis petiolatis obovatis subserratis, racemis lateralibus nutantibus densissime multifloris, floribus sessilibus multiseriatis.

Pulo Penang.—A *tree*, with grey *bark* and smooth *branches*. *Leaves* alternate or scattered, petiolate, obovate or oblong-ovate, acuminate, sometimes obtuse, with an acumen, narrowing to the base, slightly serrated, very smooth. *Petioles* roundish, thickened at the base. *Stipules* none. *Racemes* or spikes lateral, hanging, thick, massive, cylindrical, densely covered with flowers which are sessile and arranged in numerous spiral lines; the whole 8 or 10 inches long. *Bracts* none. *Calyx* superior, purple, 4-parted; laciniæ rounded, smooth, somewhat ciliated on the margin. *Corolla* purplish-red, longer than the calyx, 4-petaled; *petals* ovate, obtuse, inserted into the base of the calyx. *Stamens* white, very numerous, longer than the corolla, united at the base into a thick ring. *Anthers* yellow, didymous, the lobes bursting on opposite sides, so as to give the whole the appearance of a double 4-celled anther. *Nectary* surrounding the style within the stamens, hypocrateriform, red and

striated within, yellow and entire on the margin. *Ovary* inferior, 4-celled, many-seeded; about four *seeds* in each cell, attached to its upper and inner angle. *Style* red, as long as the stamens. *Stigma* simple. *Fruit* a berry or pome.

Obs. The inflorescence of this tree is very remarkable, and quite different from the other species of *Careya*.

CLERODENDRUM DIVARICATUM. *W. J.*
Didynamia Angiospermia.

Foliis obovato-lanceolatis acuminatis glabris, paniculis terminalibus erectis elongatis, pedicellis fructus reflexis, calyce subintegro fructifero vix aucto.

Tida tantu? *Malay.*—Found at Laye on the west coast of Sumatra.—*Stem* shrubby, erect, about two feet high, smooth; with opposite *branches* which are thickened at the joint. *Leaves* opposite, shortly petioled, obovato-lanceolate, acuminate, entire, sometimes denticulate, smooth. *Panicle* erect, terminal, long, composed of opposite divaricate ramifications which are subdichotomous and many-flowered. *Pedicels* of the fruit reflexed. *Bracts* large, ovate, acuminate, foliaceous. *Calyx* cup-shaped, nearly entire. *Corolla* tubular; *limb* 5-parted, secund, the lower segment longer, and of a blue colour. *Stamens* long, exserted. *Style* one. *Berry* deep purple, resting on the calyx, which is scarcely at all enlarged, 4-lobed, 4-seeded; 1–3 *seeds* occasionally proving abortive.

[*To be continued.*]

ILLUSTRATIONS OF INDIAN BOTANY,

PRINCIPALLY OF THE SOUTHERN PARTS OF THE PENINSULA.

By Richard Wight, M. D., &c. &c.

[In this country, and, indeed, throughout Europe, there has very lately been the greatest interest excited in what relates to the Botany of our Eastern possessions. For a long series of years, the East India Company have, with a liberality which does them the highest honour, manifested a disposition to foster this delightful science, well aware how much we owe to the vegetable creation for our food, our clothing, our ships, our buildings, and innumerable articles connected with the arts, domestic economy, and medicine; so that commerce might in consequence be materially benefitted by an increased knowledge of the vegetable productions of India.

In the year 1788, we learn from the excellent Dr. Carey's *Introduction to the Hortus Benghalensis*, that a Botanic Garden was formed at Calcutta, and, as it would appear, placed under the management of Colonel Kydd, who had, previously, a private garden, nearly on the same spot. In 1793, Dr. Roxburgh was appointed to the charge of this establishment. By his abilities and exertions, the number of species it contained in 1814, was 3500. With the aid of native artists, whose talents for flower-painting are truly astonishing, he also formed a collection of nearly 2000 drawings, which, with the descriptions made by himself from the recent plants, were transmitted to the museum of the Hon. East India Company, in London. From these, under the able direction of Sir Joseph Banks, Mr. Dryander and Mr. Brown made a selection of the most useful and curious kinds, from which the three magnificent volumes of *the Plants of Coromandel* have been compiled. During the same year in which Dr. Carey printed the *Hortus Benghalensis*, or "Cata-

logue of the Plants growing in the Hon. East India Company's Botanic Garden at Calcutta," Dr. Roxburgh's health obliged him to visit St. Helena, and eventually Europe, where he died; leaving unpublished valuable materials for a *Flora Indica.* A part, at least, of these, Dr. Carey undertook to give to the world, in 2 vols. 8vo., which appeared in 1820 and 1824, and which extend to the end of the Class *Pentandria* and Order *Monogynia* of the Linnæan System. Here, likewise, were included many plants, first made known by the exertions of Dr. Wallich and Dr. Jack, whose merits are beyond all praise, and the former of whom will be more particularly mentioned hereafter.

For a short interval, Dr. Francis Buchanan, who afterwards took the name of Hamilton, was appointed to the care of the Botanic Garden. His extensive travels, first to the Court of Ava, when he had the opportunity of seeing the kingdom of Pegu and the Andamman Isles, then over the greater part of the Peninsula, and into Nepal, gave him facilities for studying the plants of an immense extent of Indian territory, and many species, drawings, and descriptions were sent by him to Europe, and deposited, either in the museum of Sir Joseph Banks, Sir J. E. Smith, or of the East India Company. Some of his plants were published by Sir J. E. Smith in his Exotic Botany; while the Nepal Collections, together with many from Dr. Wallich, constitute the materials from which was published the *Prodromus Floræ Nepalensis*, by Mr. D. Don. Many Botanical memoirs, relative to the vegetable productions of India, were given by Dr. Buchanan Hamilton to the Transactions of the Linnæan Society. In the same work has appeared his learned Commentary on the *Hortus Malabaricus;* and in the Transactions of the Wernerian Society, his Commentary on the *Herbarium Amboynense.* After suffering much from ill health, and after enriching various Transactions with his remarks on different subjects, both scientific and literary, this able naturalist died in the autumn of last year, (1829,) at his beautiful seat of Leny, in Scotland.

The circumstance of Dr. Wallich being appointed as suc-

sessor to Dr. Hamilton, in the superintendence of the Calcutta Botanic Garden, constitutes a new æra in the Botany of India. This gentleman, a pupil of the celebrated Hornemann of Copenhagen, entered upon the duties of his office, with an ardour that has rarely been excelled in any country, and which certainly has never been equalled in a tropical climate. At his suggestion, the Directors of the East India Company placed the garden-establishment upon a footing far surpassing any thing of the kind known in Europe. The spot of ground is no less than five miles in circumference, and upwards of three hundred gardeners and labourers are employed in the charge of it. Gardens, in connexion with it, have been formed in other remote parts of the Indian possessions: collectors have been sent out to discover new, and especially useful plants, and the Residents and other gentlemen attached to science were invited to send the vegetable productions of their respective districts to Calcutta, both in a living and dried state; and among these, the Hon. Colonel Gardner, for a long time the Company's Resident at Sylhet, furnished most extensive and valuable collections.

In 1820, Dr. Wallich himself undertook a journey to Nepal, for the purpose of investigating and procuring for the Garden and the Herbarium, its rich vegetable stores. This journey occupied a period of eighteen months; at the expiration of which time, whilst descending the plains on his return home, he was attacked with a fever, that obliged him to undertake a voyage for the recovery of his health. But even this forced absence did Dr. Wallich render subservient to the cause of science. He visited Singapore and Penang, and returned to Calcutta, enriched with new treasures. The expedition to Nepal gave rise to the two valuable Fasciculi of Plants, entitled *Tentamen Floræ Nepalensis*, in folio, with fifty plates, executed in lithography by Hindoo artists.

In 1825, Dr. Wallich was engaged in inspecting the vast timber-forests of the western provinces of Hindostan, where he had the best opportunities of examining and collecting the plants of the Kingdom of Oude, the Province of Rohilcund,

the Valley of Deyra, &c. His last important excursion was to Ava, whither he accompanied the mission sent by the Hon. the East India Company, immediately after the reduction of the Birman Empire, by the valour of British troops. Here was an entirely new field laid open to the view of our enlightened and experienced Botanist; and when the collections of this vast and fertile country were united to those already deposited in Calcutta, the mass was estimated to include from eight to nine thousand species. Of the difficulty of preserving dried plants in an Indian country, few can possibly form an idea, except by actual experience. In addition to the coleopterous insects, which in all climates commit most provoking ravages on these vegetable mummies, the ants are ready in the tropics to devour both the specimens and the paper in which they are preserved. To secure them from these attacks, the only remedy is to have the cabinets insulated, by setting the feet of them in troughs of water. But so rapid is evaporation under an Indian sun, that it was the entire office of an Hindoo, after entering the museum and performing his salaam to Dr. Wallich in a morning, to go the round of the room, and replenish these troughs with water as fast as it evaporated, until the cool shadows of evening came on, and relieved him from his tedious and monotonous task.

With this vast Herbarium, with many seeds and chests of living plants, but with a constitution greatly enfeebled by a residence of twenty years, and incessant mental and bodily fatigue in fulfilling the duties of his important office, Dr. Wallich arrived in England in the autumn of 1828. Here he expressed the generous wish that all the civilized world should benefit as much as possible by his exertions, and that the duplicate specimens, which were exceedingly numerous, should be divided amongst the principal Botanists, who are also invited to take a share in the publication of those genera or families, with which they are most conversant. The large apartments of a house in Frith-Street scarcely sufficed for the reception of the collections, which, however, began rapidly to be reduced, as the distribution, which was made in

different portions, proceeded. In this dispersion, though aided by the most zealous Botanists in England, and by M. Alphonse De Candolle from Geneva, and Professor Kunth from Berlin, Dr. Wallich's personal labour has been very great: yet he scarcely relaxed for a single day. The entire examination of many species, in order to the formation of a complete catalogue, with numbers corresponding to the specimens distributed, was in itself a work of no ordinary stamp; and this has been executed in lithography and written with Dr. Wallich's own hand. But his *Magnum Opus*, and that on which Dr. Wallich's fame as a Botanist may safely rest, is his *Plantæ Asiaticæ Rariores;* a work, which, whether for the beauty or rarity and interest of the subjects, the execution of the plates, or the accuracy of the descriptions, is surpassed by no publication of this, or any other period. Already, four Fasciculi have appeared, each with twenty-five plates, on an imperial folio size, and fifty closely-printed pages of letterpress. Eight more Fasciculi will complete the work. It is not possible to conceive how Dr. Wallich can have accomplished so laborious a task, amidst all his other important employments, but by the consideration that many of these materials were completed while the author was yet resident in India.

There were still lying at the India House, very extensive collections of plants, made by other Botanists in the Company's possessions; and duplicates of these, Dr. Wallich likewise urged the Directors to distribute in the same manner as was done with his own: and here again his wishes have been complied with. When Dr. Wallich had completed as far as No. 2159, the following announcement was made of this circumstance:—

" Since the preceding sheets were printed, the undermentioned Herbaria have been added, from the East India Company's museum, to the collection brought home by Dr. Wallich, principally with a view to the distribution of their duplicates. They will be indicated in the manner noticed below.

1. An Herbarium, collected chiefly in the Circars, by the late Dr. Patrick Russel: contains no duplicates.—*Herb. Russel.*
2. An extensive Herbarium, from the Peninsula of India, collected apparently by the late Drs. Klein and Heyne, and by Dr. Rottler: it contains many duplicates.—*Herb. Madras.*
3. A very extensive Herbarium, collected in various parts of Hindostan, by the late Dr. Francis Hamilton (formerly Buchanan): containing not many duplicates.—*Herb. Hamilt.*
4. A small Herbarium of the late Dr. Roxburgh: no duplicates.—*Herb. Roxb.*
5. An Herbarium, collected by the late Mr. George Finlayson, surgeon and naturalist to the mission which was sent to Siam and Cochin-China by the Bengal Government in 1821: contains some duplicates.—*Herb. Finl.*
6. A most extensive Herbarium, collected in various parts of the Peninsula of India by Mr. Assistant-Surgeon Richard Wight, lately in charge of the Botanical establishment at Madras: contains a great number of duplicates.—*Herb. Wight.*
7. Several collections, forwarded by Dr. Wallich to the Company's museum, and including a vast number of duplicates. They will be referred to, in the manner heretofore adopted, and pointed out in the first page of this list."

In the above-mentioned list of collections, it will be seen that that of Mr. (now Dr.) Wight, stands pre-eminent. It was compiled while that gentleman was Director of the Botanic Garden at Madras. Notwithstanding the great exertions made by Dr. Wight during the existence of the Garden, with the view to furthering the cause of Botany, still more important projects were contemplated. "My arrangements were completed," he writes to me in one of the first letters I had the pleasure to receive from him, "and I was on the eve of departure on a very extensive tour, which I intended should have occupied me nearly two years. In the course of it, I would have visited all the richest botanical districts in

the South of India. Among these are the Salem and Nulgherry mountains, which rise to the height of nearly eight thousand feet above the sea; Hynaud; the Malabar coast; and, lastly, the whole range of mountains, extending from Cape Comorin to Dendyghal and Pautgaut, dividing the Peninsula into two countries, differing in their aspect, and climate, and productions, nearly as much as India differs from the South of Europe. This range forms a triangle, between sixty and seventy miles broad at the base, and producing, throughout its whole extent, many of the most curious and valuable productions of the vegetable kingdom; and in such abundance, that it is impossible to form an adequate idea of it without viewing them. It was my intention to have carried along with me the *Hortus Malabaricus*, and *Dr. Buchanan's Travels in the Mysore*, with the view of collecting and describing as many as possible of the plants figured in the former; and making drawings of all the little-known useful plants mentioned in the latter. These more important objects might easily have been accomplished, while, at the same time, my collections in every branch of natural history might have been augmented to an unlimited extent. In that time, I could have accumulated, I am convinced, not fewer than from five to six thousand species of plants; thus proving, by the most irresistible argument, the futility of estimating the value (if we may use the term to express number) of the Flora of a mountainous country by the amount of species gathered in the open cultivated parts of it: for such only are the data that Mr. Brown has had access to, when he estimated the Indian Flora at 4,500 species; a number, which, in my opinion, will be found to fall short of the reality, by nearly a half, for the country included between the latitudes of Madras and Cape Comorin alone;—if the investigation of that part is ever undertaken by an active and enterprising Botanist. I once hoped it would have fallen to my lot to make this investigation: but, alas! these hopes are all blasted in the bud."

The failure of this enterprise was caused by the dissolution of the only scientific establishment in the Madras Presidency.

Since that period, Dr. Wight's residence has been almost, if not entirely, at Negapatam; where he is engaged in his medical duties. The man of science, whatever his profession may be, will, by a well-arranged use of his time, find some leisure for his favourite pursuit: especially when, as in the present instance, that study is one intimately connected with his profession. So it is with Dr. Wight. He has diligently explored the neighbourhood of Negapatam; he has sent collectors, at his own expense, to various distances, and employed draughtsmen; and then formed the wish that the plants, thus discovered and delineated, should be made known to the world, in a form similar to that of English Botany.

These figures, and the excellent descriptions made on the spot by Dr. Wight, will be published in the present Work, under the head of "*Illustrations of Indian Botany, particularly of the Southern parts of the Peninsula.*" The drawings being generally too large for an octavo plate, it is resolved that they shall all be given on a quarto size, and coloured: and, in order that they may form a connected series, they are entitled "Supplementary," and are numbered separately from the rest of the plates in the Work.

It will be at once seen, that to Dr. Wight is due the entire merit of this publication. It remains for me only to make such additions and alterations as my more favoured situation, an extensive library, and a large herbarium, put it into my power to effect.

And here I must again express my grateful acknowledgements to Dr. Wallich, without whose friendly encouragement and important assistance, my knowledge of Indian Botany would have been limited indeed. His publications, his immense catalogue of the collections in the Museum of the Hon. the East India Company, and, above all, the numerous authentic specimens I have had the happiness to receive from the Hon. Company through him, have already enabled me to decide upon some species, whose names would otherwise still have remained in doubt.—*W. J. H.*]

Glasgow, 20*th October*, 1830.

I.

HOYA VIRIDIFLORA.

PENTANDRIA DIGYNIA. Nat. Ord. ASCLEPIADEÆ.

GEN. CHAR. *Cor.* rotata, 5-fida. *Corona staminea* 5-phylla, foliolis depressis, carnosis, angulo interiore producto in dentem antheræ incumbentem. *Antheræ* membrana terminatæ. *Massæ pollinis* basi affixæ, conniventes, compressæ. *Stigma* muticum. *Folliculi* læves. *Semina* comosa. *Br.*

Hoya *viridiflora*; foliis ovatis (cordatisvè) acuminatis membranaceis corollisque glabris, coronæ foliolis exsulcis, (folliculis pulverulento-tomentosis.) *Br.* (SUPPL. TAB. I.)

Hoya viridiflora. *Br. in Wern. Trans. v.* 1. *p.* 27. *Roem. et Sch. Syst. Veget. v.* 6. *p.* 51. *Spreng. Syst. Veget. v.* 1. *p.* 843.

Asclepias volubilis. *Linn. Suppl. p.* 170. *Willd. Sp. Pl. v.* 1. *p.* 1269.

Watta-kaka-codi. *Rheede, Hort. Mal. v.* 9. *p.* 25. *t.* 15.

A milky *shrub*. *Stems* twining: the *bark* rough and cracked; on the branches about one year old, cinerous and tuberculated. *Petioles* 1–2 inches long, round, smooth, and with the young shoots and peduncles sprinkled all over with an impalpable whitish powder. *Leaves* sometimes ovate, sometimes deeply cordate and acuminate, (perhaps these constitute different species,) of a thin membranous texture, and, like the other parts, sometimes powdery. *Flowers* green, in lateral simple umbels; *peduncles* about as long as the petioles: *pedicels* nearly the same length. *Calyx* 5-parted, small. *Corolla* rotate, 5-cleft, divisions obtuse. *Crown* of the *stamens* of 5 fleshy truncated bodies, attached to the top of the column, each furnished with a little tooth, projecting from the interior angle, which rests on the adjoining anther. *Anthers* terminated by a membrane, resting on the stigma. *Pollen-masses* erect, compressed. *Pistil: Germens* 2: *Styles* short and very thick: *Stigma* slightly convex. *Pericarp;* 2 *follicles* adhering at the base, and diverging, ventricose in the middle,

and terminating in an obtuse point, very thickly covered with a yellow impalpable powder.

This plant is common all along the Coromandel Coast, growing in almost any soil, and flowering during the greater part of the year. The leaves, peeled and dipped in oil, are much esteemed by the natives as a discutient in the early stages of boils; when the disease is more advanced, they are employed in the same way to promote suppuration.

SUPPL. TAB. I. Hoya viridiflora. *Fig.* 1, Staminal crown. *Fig.* 2, Essential organs of the flower, the crown being removed:—*magnified.* *Fig.* 3, Follicles:—*natural size.*

II.

CEROPEGIA BULBOSA.

PENTANDRIA DIGYNIA. Nat. Ord. ASCLEPIADEÆ.

GEN. CHAR. *Corona staminea exterior* abbreviata, 5-loba, foliolis ligularibus indivisis. *Massæ pollinis* basi affixæ, marginibus simplicibus. *Stigma* muticum. *Folliculi* cylindracei, læves. *Semina* comosa. *Br.*

Ceropegia *bulbosa;* pedunculis umbellatis, foliis ovatis carnosis, limbo corollæ hirsuto, coronæ laciniis longioribus subulatis apice incurvis, brevioribus subbicornubus. (SUPPL. TAB. II.)

Ceropegia bulbosa. *Roxb. Cor. v.* 1. *t.* 7. *Willd. Sp. Pl. v.* 1. *p.* 1275. *Roem. et Sch. Syst. Veget. v.* 6. *p.* 2. *Spreng. Syst. Veget. v.* 1. *p.* 842.

Root, an orbicular flattened *tuber. Stem* herbaceous, perennial, twining, round, smooth. *Leaves* opposite, petioled, very smooth and succulent, varying much in form, assuming on the same plant almost every figure between lanceolate and orbicular, but usually terminating in a sharp point. *Flowers* umbelled; *peduncles* lateral, shorter than the leaves: *pedicels* furnished at the base with scaly *bracteas. Calyx* 5-partite. *Corolla* tubular, ventricose at the base, narrower upwards, and then suddenly enlarging at the *limb*, and 5-cleft; divisions clavate, erect, arched inwards at the apex, where they unite;

densely covered externally with brown hairs. *Staminal crown* double, the *exterior* one of 5 short, broad lobes, each terminating in two projecting angles: the *interior* crown of 5 long, subulate, incurved threads, opposite to the exterior ones. *Pistil: Germens* 2: *Styles* none: *Stigma* flat, naked, large. *Pericarp; follicles* 2, cylindrical, diverging, tapering to a sharp point.

The plant from which the accompanying figure was made, was raised in my garden, from bulbs brought some months before from the neighbouring country. These blossomed in October, and have now been in flower and fruit nearly four months.

Suppl. Tab. II. Ceropegia bulbosa. *Fig.* 1, Corolla, laid open. *Fig.* 2, Calyx, with the essential organs of fructification and staminal crown:—*magnified.*

III.

ARUM CRENATUM.

Monœcia Polyandria. Nat. Ord. Aroideæ.

Gen. Char. *Spatha* monophylla, cucullata. *Spadix* apice nudus, medio staminifer, antheris multi-serialibus; basi fæmineus: sæpius staminibus pistillisve sterilibus fertilibus approximatis. *Baccæ* uniloculares, polyspermæ. *Semina* parieti altero inserta. *Radicula* umbilico obversa.

Arum *crenatum;* acaule, foliis cordato-hastatis acutis, lobis rotundatis, spatha subcylindracea convoluta margine undulato-crenata infra medium contracta basi truncata spadicem cylindraceum valde superante. (Suppl. Tab. III.)

Stemless. *Root,* a flattened brown *tuber,* throwing out white fibres. *Petioles* a span long, slender, sheathing at the base, slightly furrowed on the inner-side. *Leaves* ovato-cordate, somewhat hastate, 3 inches long, entire, waved; the lobes rounded, very obtuse; the nerves oblique, parallel, uniting within the margin; shining and bright-green above, glaucous beneath. *Scape* shorter than the petioles, cylindrical, purplish above. *Spatha* 4–5 inches long, almost

cylindrical, shortly acuminated, convolute, with margins singularly waved, and crenate, and red, ventricose and truncate at the base, contracted just above the base; its colour pale yellow-green, striated. *Spadix* about half the length of the spatha, cylindrical, dark-purple, and naked above, the very base surrounded with germens: the middle part antheriferous: above and below the anthers are filamentose glands. *Anthers* sessile, 2-celled, sharp-pointed, opening laterally. *Germen* subglobose, below trigonous, 1-celled, with 3 *ovules*, of which only 1 becomes a perfect *seed*. *Stigma* sessile, orbicular, wavy round the edge.

Found in shady places, or in wet sandy soil, flowering and ripening its fruit during the rainy and wet seasons of the year.

[In his MSS., Dr. Wight justly alludes to the similarity of this plant to the *Arum divaricatum*, *L.* (*Rheede*, *Mal. v.* 11. *p.* 20,) but that has a remarkably attenuated spadix, exceeding the spatha in length. The *A. mucronatum*, *Lam.*, too, agrees with it in many points, judging from the character given of it by Sprengel; but that species is, according to the references in Rumphius, (*v.* 5. *p.* 106,) caulescent, 8 or 10 feet high, and esculent. I think there can scarcely be doubt of this being an hitherto undescribed plant.—*H.*]

Suppl. Tab. III. *Fig.* 1, Spadix, with the lower part of the spatha laid open. *Fig.* 2, Stamen. *Fig.* 3, Section of an unripe berry:—*magnified.*

IV.

MICROCARPÆA SPATHULATA.

Diandria Monogynia. Nat. Ord. Scrophularinæ.

Gen. Char. *Cal.* tubulosus, 5-gonus, 5-fidus (nunc 3-fidus.) *Cor.* bilabiata. *Stam.* 2, antherifera, sterilia nulla. *Caps.* bivalvis dissepimento contrario. *Br.*

Microcarpæa *spathulata;* repens, foliis lineari-spathulatis longitudine scapi. *H.* (Suppl. Tab. IV.)

Peplidium capense. *Spreng. Syst. Veget. v.* 1. *p.* 43. *Wight, MSS.*

Limosella diandra. *Linn. Mant. p.* 252. *Willd. Sp. Pl. p.* 342.

A small, creeping, aquatic plant. *Stems* filiform, jointed. *Leaves* opposite, spathulate, from half an inch to an inch long, erect, or, more properly speaking, growing at right angles with their horizontal stem. *Peduncles* axillary, longer than the leaves, generally opposite, except where a branch springs, when the latter occupies the place of the leaf. *Calyx* campanulate, 3-cleft, segments obtuse. *Corolla* tubular, somewhat 2-lipped; upper lip large, emarginate, sometimes bifid; under-lip 3-lobed, the middle lobe largest, all very obtuse. *Stamens* 2: *filaments* as long as the tube, incurved: *anthers* 2-celled. *Style* about the length of the stamens: *stigma* compressed, and hooked over the approximated anthers. *Capsule* inclosed in the permanent calyx, 2-celled, many-seeded: *seeds* compressed, arranged round a central placenta.

Found in wet soil, near tanks; sometimes under water. It is perhaps a common plant; but I have only met with it twice: once near Madras, and once a few miles from Negapatam; in both instances growing in sandy soil. The small size, which renders it difficult to be recognized except when occurring in patches, is perhaps, the reason why it is considered unfrequent. Specimens were gathered in September, 1829.

[In habit, the present little plant is assuredly very nearly allied to *Limosella.* It differs, however, essentially in the number and situation of the stamens, and in the stigma. Sprengel has united it with *Peplidium,* whose character is to have an indehiscent capsule. To me, it appears to arrange best with the *Microcarpæa* of Mr. Brown; differing chiefly, if not entirely, in the number of divisions to the calyx, 5 in *Microcarpæa,* 3 in our present plant. I have once observed 4 lobes, so that the number does not seem to be constant.—*H.*]

Suppl. Tab. IV. *Fig.* 1, Tuft of Microcarpæa spathulata:—*natural size.* *Fig.* 2, Plant:—*magnified.* *Fig.* 3, Flower, with the calyx laid open. *Fig.* 4, Corolla, laid open to show the stamens and pistils. *Fig.* 5, Calyx, with the ripening germen. *Fig.* 6, Section of the germen. *Fig.* 7, Seed. *Fig.* 8, An old capsule, with its valves burst, the seeds having been discharged, and the receptacle of

the seeds remaining:—all but fig. 1 more or less *magnified.*

V.

ELATINE AMBIGUA.

OCTANDRIA MONOGYNIA. Nat. Ord. ELATINEÆ. *Cambass.*

GEN. CHAR. *Cal.* 3–4-partitus, persistens, inferus. *Pet.* 3–4. *Stam.* 3–6–8. *Styli* 3–4, breves. *Caps.* 3–4-valvis, 3–4-locularis. *Semina* cylindrica, longitudinaliter sulcata, transversimque striata. *Semina* placentis centralibus affixa.

Elatine *ambigua;* foliis oppositis ovato-subspathulatis, floribus alternis oppositisque pedicellatis. (SUPPL. TAB. V.)

A small, diffuse plant. *Stems* round, jointed, rooting at the base, ascending towards the apex, 2–4 inches long. *Leaves* opposite, ovate, entire, nerveless, attenuated at the base, hence presenting a form which may be considered between spathulate and ovate, bearing in their axils either two opposite flowers, or a flower and a branch. *Stipules* membranaceous, embracing the stem and base of the peduncle with the petiole, but so small as to be invisible to the naked eye, appearing, under the lens, slightly lacerated. *Peduncles* opposite, solitary, 1-flowered, at first drooping, afterwards erect. *Calyx* of 3 linear, obtuse sepals. *Corolla* 3-petaled, about twice as long as the calyx, of a pale rose-colour. *Stamens* 3, opposite to the sepals, and of the same length as the calyx. *Anthers* globular, 2-celled, bursting longitudinally. *Ovary* obovate, closely embraced by the corolla. *Styles* 3. *Stigmas* simple, of a reddish colour. *Capsule* 3-valved, 1-celled; *seeds* numerous, oblong-ovate; attachment central.

[As Dr. Wight gives no particular station for this plant, it is probably not of uncommon occurrence in India, notwithstanding that Cambassédes seems to think the genus *Elatine* peculiar to Europe. The present is, indeed, too nearly allied to the British species.—*H.*]

SUPPL. TAB. V. Elatine ambigua. *Fig.* 1, Plant. *Fig.* 2, Portion of a flowering branch. *Fig.* 3, Front view of a Flower. *Fig.* 4, Capsule. *Fig.* 5, Capsule burst open and showing the seeds:—all more or less *magnified.*

VI.

CISSUS SERRATIFOLIA. *Rottl.*

TETRANDRIA MONOGYNIA. Nat. Ord. AMPELIDEÆ.

GEN. CHAR. *Cal.* subinteger. *Pet.* 4, ab apice ad basin, more solito, abscedentia. *Stam.* 4. *Ovarium* 4-loculare. *Bacca* 1–4-sperma.

Cissus *serratifolia;* foliis pedato–7-foliolatis, foliolis lanceolatis acuminatis remote serrato-dentatis, ramulis glauco-pulverulentis. (SUPPL. TAB. VI.)

Cissus serratifolia. *Rottler, MSS.*

I regret that I know so little of the present plant, which I think may be easily distinguished from the *Cissus pedata,* the only one with which it can be confounded. There is a tendril opposite to every other leaf.

[The only tolerable specimen that Dr. Wight had the opportunity of examining of this *Cissus* was the one here figured; and that is evidently in so young a state in regard to the flowers, that it appears to afford no distinguishing mark from the *C. pedata,* which I have received both from Dr. Wallich and Dr. Wight, save in its glaucous and pulverulent stem. It is, however, the *C. serratifolia* of Dr. Rottler, who has, doubtless, satisfied himself of its character as a species from an examination of perfect specimens.—*H.*]

VII.

CONVOLVULUS MUNITUS.

PENTANDRIA MONOGYNIA. Nat. Ord. CONVOLVULACEÆ.

GEN. CHAR. *Cal.* 5-partitus. *Cor.* campanulata, plicata. *Stigma* divisum. *Caps.* 2–3-locularis, 2–3-valvis.

Convolvulus *munitus*; volubilis, foliis quinatis, foliolis lato-lanceolatis acuminatis integerrimis hirsutis, pedunculis multifloris calycibus cauleque hispidissimis.

Convolvulus munitus. *Wall. Cat. of Pl. in E. Ind. C. Mus. n.* 1354.

Convolvulus hirsutus. *Roxb. MSS. cum Ic.* (non Bieberst.)

Convolvulus pentaphyllus. *Wight, MSS. Linn. Sp. Pl. p.* 223? *Jacq. Ic. Rar. t.* 319?

Stem somewhat shrubby, twining, round, hispid, each hair springing from a reddish-brown papilla. *Petioles* round, hairy, about the length of the leaflets, terminating in a 5-fingered, peltate *leaf.* *Leaflets* of unequal size, broadly lanceolate, entire, tapering at the base and ending in a rather long, narrow, obtuse acumen, hairy on both sides, but not so profusely as on the other parts of the plant. *Peduncles* axillary, round, papillose, hispid, many-flowered, once or twice dichotomous with a solitary, long, pedicellate *flower* in the fork: *bracteas* 2, at each division. *Pedicels* thickened upwards, compressed, somewhat ancipitate near the calyx. *Calyx* ovate, 5-parted, the three outer divisions ovate, concave, tapering to a sharp point, very hairy, enclosing the other two, which are smooth, white, and membranous. *Corolla* bell-shaped, a little longer than the calyx; *limb* plaited, white. *Stamens* 5; *filaments* about half the length of the corolla; *anthers* sagittate, after bursting twisted. *Pistil: Germen* surrounded at the base by a glandular cup. *Style* filiform; *Stigma* 2-lobed; *Capsule* 4-valved, 4-celled; *cells* 1-seeded; *seeds* convex, triangular.

This plant is of rare occurrence in the neighbourhood of Negapatam, being found occasionally growing in dry and sandy soil, where it twines upon the hedges and bushes, and produces flower and fruit during the greater part of the cool season. In its earlier stage, each peduncle seems to bear but one flower, and has two bracteas about the middle of its length; but from the axils of these bracteas, a branch afterwards springs, which goes through the same process of producing new branches and new inflorescence. How often this may be repeated, I am unable to say; but I have specimens now lying before me, which exhibit three successive instances of this increase.

[Were it not that the *Conv. pentaphyllus* of *Linn.* and *Jacq. Ic. Pl. Rar.* is an American species, I should have been inclined to consider, as Dr. Wight was disposed to do, our present plant as identical with it, so closely are they allied. Be that as it may, we are certain that it is the same with Roxburgh's *C. hirsutus,* (not of Bieberstein,) and the *C.*

munitus of Wallich, whose name it is, perhaps, the safest to adopt.—*H.*]

SUPPL. TAB. VIII. Convolvulus munitus. *Fig.* 1, Lower part of the corolla laid open to show the stamens. *Fig.* 2, Calyx and pistil; the corolla and stamens having been removed. *Fig.* 3, Capsule. *Fig.* 4, Transverse section of capsule:—*natural size.*

VIII.

CONVOLVULUS RHEEDII.

PENTANDRIA MONOGYNIA. Nat. Ord. CONVOLVULACEÆ.

GEN. CHAR. *Cal.* 5-partitus. *Cor.* campanulata, plicata. *Stigma* divisum. *Caps.* 2–3-locularis, 2–3-valvis.

Convolvulus *Rheedii;* caule procumbente tuberculato radicante, foliis spathulatis emarginatis mucronatis pedunculos articulatos excedentibus, calycis segmentis exterioribus maximis cordatis.

Convolvulus Rheedii. *Wall. Cat. of Pl. in E. Ind. C. Mus. n.* 1358.

Convolvulus emarginatus. *Herb. Heyn.*

Convolvulus uniflorus. *Wight, MSS. Burm. Ind. p.* 47. *t.* 21. *f.* 2.

Stem procumbent, slightly marked with tubercles, from which spring numerous fibrous *roots* wherever it comes in contact with the ground. When growing near water, the branches which shoot into it become floating, and continue to increase as on land; but the stem shows no tendency to ascend among bushes. *Leaves* on rather long petioles, between elliptic-oblong and spathulate, very frequently emarginate and mucronate, otherwise entire, smooth on both sides. *Peduncles* axillary, shorter than the leaves, jointed in the middle, and bearing two small lanceolate bracteas at the joint. *Calyx* 5-parted, the divisions very unequal, the three outer ones much the largest, cordato-ovate, acute, 5-nerved: the inner two lanceolate and very delicate; all pale greenish white. *Corolla* white, small in proportion to the calyx, ex-

panding during the forenoon. *Stamens* within the tube: *filaments* hairy at the base: *anthers* oblong. *Pistil*: *Germen* superior, 2-celled: *Style* filiform: *Stigma* of two round lobes. *Capsule* globular, large, enclosed in the persistent calyx, 2-celled, 4-valved, 4-seeded: *Seeds* obsoletely triangular, hairy on the angles.

I found this plant on the edge of a small tank, growing equally on land and water, covered with flowers and ripe fruit in December, and producing abundance of fibrous roots all along the under-edge of its stem; but though the tank was surrounded with bushes, the stems showed no tendency whatever to ascend from the ground. The voluble appearance which the individual represented in the accompanying plate appears to assume, is more a contrivance of the artist, whereby to display a larger portion, than a faithful exhibition of its general mode of growth. Yet it is not altogether unnatural, as some specimens have occasionally a disposition to twist at their extremities; caused by the efforts made by the young shoots to penetrate through the thick green mat which the plant forms.

[As it appears doubtful whether this be the real *Conv. uniflorus* of Burman's *Fl. Ind.*, and assuredly it does not well accord with the figure of that author, Dr. Wallich has, with much propriety, separated it in his valuable Catalogue, and given it the name here adopted.—*H.*]

Suppl. Tab. VIII. *Fig.* 1, Pistil: the calyx and corolla having been removed; the bracteas remaining. *Fig.* 3, Section of an unripe capsule. *Fig.* 4, Seed:—*natural size.*

IX. X.

PYRENACANTHA VOLUBILIS.

Diœcia Tetrandria. Nat. Ord. Stilagineæ.? *Agardh, Lindl.*

Gen. Char. Masc. *Flores* spicati vel capitati, bracteati. *Cal.* 4-partitus. *Cor.* 0. *Stam.* 4 calycis laciniis alternantia, ad basin glandulæ papillosæ. *Filamenta* brevia. *Antheræ* biloculares, longitudinaliter dehiscentes.—Fœm.

Cal. 4-(rarius 5)-partitus, basi bracteatus. *Germen* superum, hispidum; *ovula* 2, pendula; 1 abortivum. *Stigma* sessile, multiradiatum. *Drupa* 1-locularis, 1-sperma. *Nux* extus depresso-punctata, intus muricata spinulis numerosis obtusis. *Semen* pendulum. *Albumen* carnosum, crassum, spinulis penetrantibus perforatum. *Cotyledones* foliacei. *Embryo* ad hilum versus.—Nomen πυρηνα, *nux*, and ακανθα, *spina*, ob nucem intus spinulis muricata.

Pyrenacantha *volubilis*. (Tab. IX. X.)

A milky *shrub*, with filiform, rounded, scabrous *stems*: the older ones brown. *Petioles* alternate, rounded, glabrous, flexuose, from half an inch to an inch long. *Leaves* oblongo-elliptical, retuse, veiny, especially beneath, where they are rather scabrous; the margin slightly revolute, entire, or remotely toothed. Male plant: *Peduncles* usually from a little above the axils, slender, about as long as the leaves, bearing a filiform spike of *flowers* at the extremity; each flower having a small bractea at a little distance below, and on one side. *Calyx* 4-partite, externally rough, with appressed hairs; its segments ovate, acute. *Cor.* 0. *Stamens* 4, inserted at the very base of the calyx, and surrounding a small tuberculated gland, or abortive germen. *Filaments* short, swollen at the base. *Anthers* roundish, 2-celled, opening by longitudinal fissures.—Fem. plant: *Peduncle* much shorter than the male, bearing at its very extremity a *capitulum* of 5 or 6 sessile, minutely-bracteated *flowers*. *Cal.* as in the male (sometimes 5-partite.) *Germen* oval, hispid with numerous erect hairs, 1-celled, containing 2 pendulous ovules; 1 abortive. *Stigma* sessile, radiated, concave. *Drupe* broadly ovate, slightly compressed and margined, rough. *Nut* fragile, externally marked with many little pits, corresponding with a number of obtuse prickles, which line the inside of the *nut* or *testa*, and give it an exceedingly beautiful appearance when viewed under the microscope. These prickles penetrate almost to the centre of the *albumen*, so that when the *testa*, with its prickles, is removed, the albumen is found perforated with holes. *Albumen* fleshy, bearing in the centre the *embryo*,

with its thin, large, foliaceous *cotyledons*, and its short *radicle* turned upwards towards the *hilum*.

This appears to be a very rare plant, since I do not recollect seeing it except in one spot, and that was in a sandy soil, twining among hedges at Vellenganny, bearing both flower and fruit in the month of November. Some of the stems were upwards of 10 feet high, yet their greatest thickness did not exceed that of my finger.

[I have borne testimony to the fidelity of the above description, by an accurate analysis of the flowers, both male and female, and fruit. Dr. Wight has added in his MSS., "The plant appears to constitute a new genus, but it will probably rank in the Nat. Order among the *Amentaceæ* or *Urticeæ*, and in the character of its flowers it approaches *Nageia*."—As to its genus, I quite agree with my valued friend that it does form one distinct from any yet described, and since it was sent to me without a name, I have ventured to call it *Pyrenacantha*, from the remarkable spinous processes which line the inside of the nut. In regard to its Natural Order, it behoves me, like Dr. Wight, to speak with great caution. In habit and in its milky juice, it approaches near to some *Euphorbiaceæ;* but neither its fruit nor its flowers correspond with any of that family. In the circumstance of the two inverted ovules, and, indeed, in the general character of the fruit, it resembles *Stilago:* but its stamens are totally different, and they alternate with the divisions of the calyx, instead of being opposite to them. These, however, seem to me to be the only essential points of distinction; and hence, though doubtfully, I have marked it as belonging to the Nat. Ord. *Stilagineæ* of Agardh and Lindley.—*H.*]

Suppl. Tab. IX. Pyrenacantha volubilis; *masc.*, *Fig.* 1, Portion of the spike of male flowers:—*magnified.*

Tab. X. Pyrenacantha volubilis; *fœm.*, *Fig.* 1, Portion of a female plant:—*natural size.* *Fig.* 2, Female flower. *Fig.* 3, Pistil. *Fig.* 4, Section of do. *Fig.* 5, Portion of a female plant in fruit, and *fig.* 6, Nut, from the drupe:—*natural size.* *Fig.* 7, Inner view of the testa:—*slightly*

magnified. *Fig.* 8, Drupe, with part of the fleshy coat removed. *Fig.* 9, Section of the nut, to show the albumen. *Fig.* 10, Transverse section of the albumen. *Fig.* 11, Embryo. *Fig.* 12, Portion of the testa, with its prickles within:—all more or less *magnified,* except figs. 1, 5, and 6.

[*To be continued.*]

SKETCH OF A SHORT BOTANICAL EXCURSION IN JAMAICA.

By James Macfadyen, M. D.

There are few works on Natural History that have done more to render the science attractive and have been more generally read, than the Natural History of Selbourne. Calculated to excite a similar interest, are the short accounts which have been given of excursions, made with a view of gratifying a taste for this department of science. The narrator is, in this manner, enabled to present us with a series of simple facts; blending with the common-place matter of his journal, notices of what appear to him novel or remarkable in the productions of the district through which he has passed. In reading such, we, in a manner, become his companions,—mark every striking object that meets him in his path, and sympathize in the pleasure of contemplating each beautiful feature, or unusual phenomenon. Under impressions such as these, I have been led to draw up the following account of a little excursion, made in the neighbourhood of Spanish-Town. I shall, by this means, be enabled to point out the localities of several of the rarer plants, to notice the influence of soil and climate, and to convey an idea of the vegetation of the district, in a clearer manner than could otherwise be effected.

In the morning of Monday, the 22d December, 1829, I left Spanish-Town. My road lay towards St. John's, the hills of which, marking the boundary of the two parishes, rose

conspicuously in the distance. Before me was stretched the plain of Liguanea, bounded towards the South by the sea, and on the East by the precipitous range of the Blue Mountains. The sun had not yet emerged above the horizon, the hills were unclouded, and the outline of their woody ridges was most distinctly marked. The air was cool, the thermometer standing at 64°, and we journeyed on, refreshed by the occasional land-breeze that came across us, laden with the fragrance of flowers—

> ——————— "Gentle gales
> Fanning their odoriferous wings, dispensed
> Native perfumes, and whispered whence they stole
> Their balmy spoils."

This is indeed that season of the day when we can boast that this climate affords us all we can desire; the delightful coolness of the matin prime is rendered more grateful by the recollection of the parched noon of the preceding day, the oppressive heat of which a few hours are about to bring back. There is one deficiency, however, that must ever strike the traveller from Europe. No song of the feathered tribes greets him in his way. At times, it is true, he may listen to the lay of our Transatlantic nightingale, (*Turdus polyglottus,*) as, seated on some spray, it pours its rich and varied note in reply to some other of its species, with whom it would appear to carry on a rivalry in song. More commonly, however, we are annoyed with the harsh cry of the *Savannah Black-bird,* (*Crotophaga Ani,*) which gives warning to its companions of the approach of a stranger, or to the chirp of the *Grass-bird,* or the dreary note of the *Bald-coot,* (*Fulica atra,*) sounding from some lonely morass.

The Botany of the immediate neighbourhood of Spanish-Town is far from being interesting. The land which is not cleared for the purposes of pasturage is almost entirely occupied by thickets of *Logwood,* (*Hæmatoxylon Campechianum,*) the *Poponax,* (*Acacia tortuosa,*) and the *Cashaw,* (*A. juliflora.*) These are all introduced plants, which have become naturalized. They are useful as fuel; being recom-

mended by the quick growth and close texture of their wood. The first also supplies a well known dye-stuff; the second yields a gum, not inferior to the common descriptions of *Gum Arabic;* whilst from the wood of the last, the most durable description of shingles is made. In a ditch, about half a mile from the town, I observed an *Evolvulus*, (No. 4 of Browne's Natural History of Jamaica,) the character of which I give in the subjoined note.* Along with it grew, in great profusion, the *Oxalis stricta*, or *Wood-sorrel.* Farther on, in a swampy piece of ground, on the left side of the road, the beautiful azure flowers of the *Pontederia vaginalis* attracted the eye. We also observed on the fences, the *Convolvulus nodiflorus*, which being common in many districts, it is remarkable that no one has noticed as a native of this Island. For some distance after this, there was little to awaken our botanical exertions. We met with a few straggling *Fustics*, (*Morus tinctoria*); and that handsome tree (*Cæsalpinia bijuga*) conspicuous at a distance, by its bright golden-hued flowers, backed with the deep verdure of its foliage. The *Bastard Cedar* (*Bubroma Guazuma*) grows here, as everywhere else, in abundance. I notice it, principally for its great utility; the berry, from the albumen it contains, affording a nutritious substitute for corn to horses; the bark, from possessing similar vegetable principles, being applicable to the purpose of clarifying the cane juice; while the wood is as extensively employed for the staves of sugar-hogsheads.

On ascending the Red Hills of St. John's, (four miles from Spanish-Town,) we met with a somewhat greater variety of plants. The fences and outskirts of the wood-land were covered with creepers. The *Coreopsis reptans* hung down its gaudy yellow flowers, contrasting with the profuse snowy blossoms of the *Christmas gambol*, (*Convolvulus polyanthos*); while the *Ipomæa argentea*, called by the Negroes *Wild Hogsmeat*, was found entwined with the *Eupatorium ivæ-*

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* *Evolvulus nummularius, Linn.;* (Spec. Char.) *leaves* roundish, oval, retuse, apiculated; *stem* creeping, pubescent; *flowers* solitary, axillary, peduncled; *peduncle* shorter than the leaf, capillary, pubescent.

folium and the *Mikania amara.* We here also observed an exotic, now abundant everywhere, the *Abrus precatorius,* or *Wild Liquorice,* a native of Asia, displaying plentifully its flesh-coloured spikes, and its showy scarlet seeds; which are commonly known by the name of *Crab's eyes.* I had now, for the first time, an opportunity of observing a very beautiful, and, so far as I can ascertain, a new species of *Phaseolus,* a description of which I subjoin.* The *Dodonæa jamaicensis,* bearing its minute flowers and angular capsules, is very common in this district. I stopped here, beneath a lofty specimen of the *Eriodendron anfractuosum,* to admire its brilliant rose-coloured flowers, and to compare it with the other commoner tree, (*Bombax Ceiba,*) which also receives the appellation of *Cotton-tree.* At this season of the year, the old leaves are shed, and the new ones do not make their appearance till the ripening of the seed, as if this giant

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* Phaseolus amœnus.—Twining; *branches* sub-pubescent: *leaves* ovate, sub-cordate, sub-acuminate, apiculated, above glabrous, beneath, along the nerves, somewhat hairy; *calyx* slightly ciliated, with the three lower lobes sub-equal, the upper one emarginate.

Descr.—*Stem* twining, green, sub-angular, slightly pubescent; *leaves* ternate; *leaflets* ovate, the middle one at the base emarginate, the lateral cordate; subacuminate, apiculated, entire, above glabrous, beneath (especially along the nerves) somewhat hairy, sub-ciliate, dark green. *General stipules* small, oblongo-lanceolate, membranaceous. *Partial stipules* oval; a pair at the insertion of the lateral leaves; another pair a little below the middle leaf. *Petiole* sub-tetragonal, channelled above, puberulous. *Racemes* 2–3–4-flowered; *flowers* showy, fragrant, placed on short single-flowered pedicels, at the extremity of the common peduncle. *Peduncle* shorter than the leaf, roundish. A *bractea* exists at the insertion of each pedicel, minute, ovate, concave, green. *Calyx* striated, appearing under the microscope ciliated, 2-lipped; upper lip sub-emarginate; lower trifid, with the divisions nearly equal. *Corolla: Standard* roundish, sub-emarginate, purplish. *Wings* broadly sickle-shaped, furnished internally with a small, roundish, foliolar appendage, placed above the subulate prolongation by which they are inserted. *Keel* with a long spirally-twisted *beak,* adhering above. *Stamens* diadelphous; the single stamen geniculated towards the base and incrassated. *Filaments* delicately capillary. *Anthers* linear-oblong, yellow. *Germen* greenish, puberulous; *Style* bearded beneath the *stigma,* which is greenish, obtuse. *Legume* about 6 inches long, and one-third of an inch broad, compressed, linear, straight, with a long beak. *Seeds* oval.

Fl. Summer and Autumn months.

of our forest-trees called in all its energies during the period when it was engaged in the perfecting of its fruit.

A mile or two farther on, we came to a level tract, which a few years ago had suffered from the ravages of fire. It is now covered with a rich sward of *Guinea-grass* (*Panicum jumentorum*); for it is a remarkable circumstance, that fire, while it destroys all other vegetable substances, spares the seed of this plant, so that it springs up on the first rains, and clothes the whole land with a rich mantle of verdure. Fire is, indeed, the agent usually employed by the inhabitants in clearing their grass-pieces, destroying every other plant, with the exception of this salamander-like exotic. Here and there, among the grass, the *Ebony* (*Brya Ebenus*) might be seen rising, covered profusely with its flame-coloured blossoms. Among the more common plants were the *Indigofera Anil* and *I. tinctoria;* the different *Broom-weeds*, such as the *Waltheria* and *Melochia pyramidata;* as also *Sida althæifolia*, *Croton pennicillatum*, &c. Thousands of the West Indian *Ortolan* (*Motacilla Trochilus*) were observed among the tall grass, feeding on its seed.

Passing over this tract, we entered again upon a piece of woodland. We here also found the outskirts covered with the twining syngenesious plants, and the *Convolvuli*, formerly noticed. The *Croton Cascarilla*, a medicinal plant, is here frequent, as also the *Snowberry*, (*Chiococcus racemosa*,) and the *Calea jamaicensis.* A singular myrtle-leaved plant, probably a species of *Loranthus*, was very common, bearing at this season of the year its snowy, compound, 2-seeded berries. The *Cockspur* (*Pisonia aculeata*) was just coming into flower, hanging down its long trailing branches, interlaced with those of the *Achyranthes altissima*, and the *Rivina octandra.* The *Cassia viminea*, supporting itself on the neighbouring shrubs, had shed its last flowers, and the pods were forming. Here also the *Mountain Ebony* (*Bauhinia porrecta*) displayed its showy variegated blossoms. Together with it grew the *Acacia leucocephala*, and the *Cestrum vespertinum*, with its lurid flowers. In this place, a number of our West Indian *Timber-trees* were to be observed; such as the *Wild Tamarind*,

(*Acacia arborea,*) the *Fiddle-wood,* (*Cytharexylon caudatum,*) the *Yoke-wood,* (*Bignonia leucoxylon,*) &c. Several of our *Fruit-trees* were also common, such as the *Avocada Pear,* (*Laurus Persea,*) and the different species of *Annona.*

We now reached the point where the Vale of Guanaboa comes into sight. Having as yet passed through a district, which, with the exception of some pasture-land, may be said to be uncultivated, the Vale, partly covered with canes, and divided into grass-pieces, presenting a continual verdure, appeared more beautiful than it would otherwise have done. In a pond at Aylmer's Estate, I observed the *Little Grebe,* (*Podiceps minor,*) along with the *Wild Duck,* (*Anas Boschas,*) and the *Teal,* (*A. Dominica.*) On the fences of this district, which are of *Logwood,* we remarked the *Dendrobium utricularioides,* the *Limodorum filiforme,* and a species of *Vanda,** (*Sarcanthus* of Lindley.) Along with them grew a *Tillandsia,* agreeing, in many points, with the *T. bulbosa,* (*Hooker.*) On the borders of the ponds, which are common in this neighbourhood, grew the *Panicum Myurum,* and another species, a short notice of which is subjoined.†

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* As I have not seen specimens to enable me to determine the genus of this Orchideous plant, I shall merely give the account of it as communicated by Dr. Macfadyen.—*Ed.*

Vanda *sp.*? *Leaves* bifid at the apex sheathing, with the sheaths bidentate.

Descr.—*Root* of many, round, white, cord-like fibres, arising, for the most part, from different points of the stem and the axils of the racemes. *Stem* about 6 inches long, reddish, compressed, jointed, leafy. *Leaves* alternate, distichous, sheathing, oblong, attenuated at the base, emarginato-bifid at the apex, with one of the divisions shorter than the other. *Sheaths* furnished at the mouth with a tooth on each side of the origin of the leaf. *Flower-spikes* or *racemes* arising from the joints of the stem, immediately under the leaves, spreading horizontally. *Flowers* secund, bi-serial, white, tinged with red, subsessile. *Bracteas* minute, ovate, acute. *Petals* 6, subæqual, oblongo-lanceolate, acute. *Labellum* resembling the petals in form, with 2 expansions at the base, by means of which it embraces the column, prolonged anteriorly into a spur, which is longer than the *germen,* gibbous. *Anther* terminal, operculated, deciduous. The cavity leading into the spur is immediately beneath the receptacle of the *pollen-masses.* *Capsule* two-thirds of an inch long, oblong-roundish. *Seeds* numerous.—Flowers throughout the year.—Hab. The Vale of Guanaboa.

† Panicum aristatum;—*Spikes* panicled, subverticillate, about three together,

The twining plants, observed here, were the *Aurora* (*Ipomæa glandulifera*), the *I. punctata*,* *Teramnus uncinatus*, *T. volubilis*, *Glycine caribæa*, and *Asclepias viminalis*. On every dry bank, the *Swertia filiformis* displayed its small, but beautiful purple flowers. The *Cassia pilosa* was very common, the *C. Parkeriana* more rare. The *Eupatorium odoratum* had just faded, and the legumes of the *Hedysarum molle* were beginning to form. In a marsh, near the reservoir of Lloyd's Estate, the *Pontederia limosa* was found in abundance with the *Hydrocotyle vulgaris*. The *Laurus Borbonia*, though this is not its usual time of flowering, was conspicuous at a distance by the profuse white bloom. But there is no description of tree so abundant as the *Orange* kind, and in no part of this Island are its varieties to be found in such perfection. Through the whole district, there is scarcely a *Bitter* or *Sour Orange* to be seen, the seed, dropped carelessly, coming up a sweet and palateable fruit. This is ascribable partly to the climate, which is dry, and partly to the nature of the soil, which is a gravelly loam, upon white limestone. During this season of the year, in particular, the *Orange tribe* form a beautiful ornament of our pastures, their golden-hued fruit contrasting well with the deep verdure of their foliage.

In the evening, we observed a long train of the *Hirundo zonaris* passing over the Vale from West to East. It is probable that in the migration southward, these birds may have

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florets secund; *calyx* furnished at the base with two or three long setæ, its innermost glume having a long awn.

Descr.—About four or five feet high. *Culm* as thick as the middle-finger, geniculated at the base. *Leaves* a foot long, broad, linear, hispid. *Ligule* with a line of long hairs. *Sheath* ciliato-setose. *Spikelets* 1–2 inches in length.

* Ipomæa punctata. Descr.—*Stem* roundish, hairy. *Leaves* cordate, 3-lobed, acuminate, hairy. *Petiole* shorter than the leaf, roundish, hairy, with the hairs proceeding, as in the stem, from a purplish gland. *Peduncle* nearly twice as long as the leaf, 6-flowered, roundish, as well as the *petiole*, hairy. *Bracteas* in pairs, as long as the pedicels, linear, subulate, hairy. *Calyx* 5-leaved, hairy, the hairs placed on roundish pellucid glands. *Sepals* long, linear-lanceolate. *Filaments* hairy at the base: *Anthers* white. *Stigma* papillose, somewhat 3-lobed.

Fl. in Autumn:—the blossoms of this, as well as *I. glandulifera*, expand in the evening, and close about ten o'clock in the morning.

followed the direction of the Continent, till they reached the latitude of this Island, when they changed their course in search of a place where they might spend their winter. During the night, we were regaled with the croaking of the *Hyla arborea*, and of a *Lizard* also, which frequents houses. This last is probably the same as the *Lizard* of Siam, described by Capt. Burney in the 17th No. of *Brewster's Edinburgh Journal*, under the name of the *Tuk-kí*. According to that writer, this animal is an object of superstition among the Siamese. With them, although only six inches long, it makes war upon rats; with us, it limits its utility to the destruction of *Cock-roaches*, and to foretelling changes in the weather.

Leaving the Vale, we now ascended the hills above Retreat Estate. The rocks of this district are all limestone, presenting, in some places, owing to the partial action of decomposition, a cancellated appearance, known in the country by the name of *Honeycomb-rock*. In the crevices grew the *Pteris longifolia*, *Hemionitis rufa*, *Anemia adiantifolia*, and that cosmopolite fern, *Adiantum Capillis-Veneris*. The *Cardiospermum Halicacabum*, and *C. grandiflorum* hung down their white flowers and balloon-like capsules: the long cord-like spikes of the *Wild Yam*, (*Dioscorea sativa*,) and the purple inflorescence of the *Stizolobium altissimum* were suspended from the trees, while the attractive lilac racemes of the *Securidaca virgata*, by means of its long trailing branches, were stretched above our path. The *Cassytha filiformis* and *Cynanchum parviflorum* were to to be met with, spread over the shrubs by the road-side. A plant of the *Eupatorium Dalea* particularly struck my attention, adorned profusely with snowy flowers, and its leaves exhaling the delicious fragrance of *Vanilla*. At a gap in the ridge, through which the track lies, we had an opportunity of admiring the *Portlandia grandiflora*, and *Hibiscus pentaspermus*; *Pavetta pentandra*, and *Erythroxylon rotundifolium*, (the latter not in flower,) were also common along this road. At this spot, we saw, for the first time, *Habenaria brachyceratites*. It is very different from *H. macroceratites*, as well as *Orchis monorhiza*, both of which are common plants in this district.

We now proceeded through a piece of woodland, not of a very lofty description, composed of the *Down-Tree*, (*Ochroma Lagopus*,) *Aralia arborea*, the *Cedar*, (*Cedrela odorata*,) the *Mahoe*, (*Hibiscus elatus*,) the *Dwarf Fan-Palm*, (*Thrinax parviflora*,) &c. In every little crevice of the rock, the *Gesneria acaulis* had taken up its abode; on its bare surface, the *Tillandsia serrata* had established itself; while the *Guzmannia tricolor* displayed its attractive spike on the branches of the trees. The *Pothos macrophylla* is here very common. On descending the hills above Spring Vale, the property of Charles N. Pallmer, Esq., I was struck with the beauty of our *Jamaica Lily*, (*Pancratium caribæum*,) fixing its bulb in the cavity of the *Honeycomb-rocks*. The *Epidendrum fragrans* and the *E. cochleatum* also did not fail to attract our notice. On the fences, among other creepers, grew that naturalized exotic *Bean*, *Dolichos Lablab*, (*Lablab vulgaris*.) A species of *Passion-flower* is also to be found here, of which, as it appeared to be new, I regret having been disappointed in taking an accurate description. Here also the profusion with which the *Orange* kind in this district produce their fruit, called forth our admiration.

On leaving Spring Vale, we caught our first glimpse of St. Thomas in the Vale. It was nine o'clock in the morning, yet the sun's rays had only begun to dissipate the thick sheet of fog with which this part of the country is covered on each returning morning. In the district through which we now passed, that lofty and valuable timber-tree, the *Broad-Leaf*, (*Terminalia latifolia*,) is very common.

Leaving Spring Vale pastures, we entered on a piece of marshy land, employed by Byebrooke Estate for the purpose of pasturage. It is almost entirely overgrown with the *Guava*, one of the most difficult of our weeds to extirpate. As a compensation for this, its fruit is relished by all kinds of stock. The acid, however, which it contains, is said to be injurious to the teeth of horses. In this part of our route, there was little to excite interest. Occasionally the profuse and showy flowers of the *Convolvulus umbellatus* and *C. polyanthos* would attract our regards. The *Tetracera jamaicensis*

is also conspicuous at this season by its golden-coloured flowers, throwing its long pliant arms for support over every shrub. In a waste cane-piece, below Pallmer's Hut, we met with a rather rare species of *Pennywort*, (*Hydrocotyle erecta.*) The *Samyda glabrata* is very common, filling the air at this season with the perfume of its short-lived flowers.

Journeying on, we crossed the Bog Walk River, which, passing out of the Vale through a ravine, assumes, near Spanish Town, the name of Rio Cobre. Even here, in body of water, it far exceeds the greater number of our Jamaica streams. It takes its origin in the mountains of Clarendon, passes through the Vale of Linda in St. Johns, till it reaches Swansea Estate, where it sinks, to re-appear, after a subterranean course of two or three miles, at River-Head Estate, in St. Thomas in the Vale. Few tropical rivers abound more in fish. On its margins we observed that solitary, yet graceful bird, the *Egret*, (*Ardea Egretta.*)

At the works of Byebrooke Estate, the *Musk Ochra*, (*Hibiscus Abelmoschus*,) was remarked, growing wild. Passing on, we reached the Savannah where the church stands. The land here is marshy: the prevailing grass is the *Wire-Grass*, (*Panicum strictum*,) disliked by the cattle. Scarcely any shrub is to be seen but the *Cocoa Plum*, (*Chrysobalanus Icaco*,) and the *Coccoloba diversifolia*. An occasional individual of the *Mucca-Palm* (*Cocos fusiformis*) might be observed, towering above its humbler neighbours. On the road-side, we gathered specimens of those rather rare plants, *Buchnera elongata, Hedysarum diphyllum, Habenaria brachyceratites, Riedleria serrata*, and a species of *Melastoma*, of which we could find no description in our systematic works. That pest of the pastures, the *Jamaica Marygold*, (*Silphium trilobatum*,) is also present here. In many parts of the Island, especially in the wet districts, this plant is so luxuriant as to take possession of whole pastures, being what is considered a weed in the eye of the pen-keeper.

In the Vale itself, as in all spots which have been long in cultivation, there are few objects to engage the notice of the Naturalist, whose richest banquets are spread in the remote

wild of undisturbed nature. We met occasionally in the pastures with the *Quail;* and the *Snipe,* (*Scolopax Gallinago,*) during this season of the year, is to be found in every ditch. On a tree, a *Whistling-Duck,* (*Anas arborea,*) was observed perching: it is seldom seen during this part of the year in this latitude, as it is supposed to migrate, to spend the winter months in Carolina. As to the plants of the neighbourhood, we noticed, in flower, the *Hyptis pectinata, H. capitata,* and *H. radiata.* Below Mount Olive House, I found the *Epidendrum anceps* on almost every tree; and on every bank *Habenaria hirta.* At Williamsfield, the *Epidendrum nocturnum* was abundant, and along with it, though of less frequent occurrence, the *Bernhardia complanata.* There was one solitary specimen of *Epidendrum verrucosum.* This gave me an opportunity of correcting a very glaring inaccuracy of Swartz, who describes the inflorescence as a scape, instead of being a terminal raceme. I should almost have considered his description as referring to some other plant, did not the specimens I speak of agree with it in every other respect. Among other plants of this district, which were now in bloom, I may enumerate *Eupatorium diffusum, Varronia arborescens, Pectis punctata, P. linifolia, Tradescantia procumbens,* and *Cymbidium utriculatum.* Two of the species of *Arundo,* noticed by Browne, were common in the river-course.

This district has been regarded as unhealthy; the negroes being more sickly, and more subject to ulcers than in any other part of the Island. This, some may be inclined to attribute, and indeed have attributed, to the influence of Malaria. There can be no necessity to ascribe effects to a supposititious agent, for which we can otherwise easily account. The true cause is most probably the morning fogs, the chilling effects of which are opposed to the intense heat of the noontide sun, which, in this district, owing to its being surrounded by hills, is only slightly relieved by the sea-breeze. We may also take into account that provisions are far from being abundant, and that the negroes are unquestionably the least improved, both in their morals and general habits, of any in the Island—retaining many of their African notions

and vices; in particular, the pernicious habit of dirt-eating. I believe I am not far from the truth in my calculation, when I say, that in this Spanish district, nine negroes out of ten will be found addicted to this singular and eventually fatal practice.

As for the unhealthiness of the district, in respect to its white inhabitants, it is only during years when the rainy seasons are heavy, and the north-easterly winds very prevalent, that it deserves this character. Since the fatal year of 1823, few parishes in the Island have been more healthy. From that period, an improvement has taken place in the habits of the occupiers of the district, which, previously, were intemperate to an excess. I have ventured on these few remarks, having frequently heard this district named as peculiarly exposed to the influence of Malaria; an agent, as has been already observed, whose existence is, at best, but conjectural, and whose repeated effects I have always, as yet, been able satisfactorily to account for, by the action of more obvious causes.

"I envy not the man," says a certain fanciful writer, "who can travel from Dan to Beersheba, and say there is naught."— I envy not the man who can say there is nothing to admire or instruct, though he should journey in the most desert region of the earth; whose only inhabitants are those of the wild, with the trace of no hand to be detected on its fair face, save that of Nature—with no art, save her's, displayed in the uprearing of the green forests, and in the blending and varying of the many-hued flowers—and no voice uttered, save her's, from the shining and everflowing streams, and in the sighing winds. It is for the Naturalist to find charms and attractions, subjects for musing and contemplation, in the most ordinary scenes, and in objects of every-day occurrence; in the path whereon he treads, on the hills with which he is encompassed, and in the atmospheric changes of the spacious canopy of heaven, spread over all.

James Macfadyen.

Hope House, St. Andrew's, 3d *July*, 1830.

THE LATE MR. BARCLAY.

In the recent death of Robert Barclay, Esq. of Buryhill, Botany and Horticulture have lost a powerful friend and patron. Extensively engaged, from an early period of life, in commercial transactions, on so vast a scale, that his name ranks among the most eminent of those "merchants who are the honourable of the earth," he yet found time to devote to the pursuit of science. His taste for gardening first displayed itself in 1781, when he went to reside at Clapham; and it was the means of his becoming acquainted with the late Mr. Aiton, Sir Jas. E. Smith, Sir Joseph Banks, Mr. Curtis, and the most zealous Botanists of that day. Mr. Barclay strenuously advised the latter to the publication of the Botanical Magazine, and foretold the great success it would experience from the British public.

But it was in 1805, when he removed to Buryhill, and soon afterwards retired from the active engagements of business, which he confided to his eldest son, the present Mr. Barclay, that the subject of this brief notice devoted himself warmly to the cultivation and patronage of science, particularly those branches of it which were connected with Agriculture and Botany. The place of his residence may be reckoned as possessing more natural beauties than almost any spot in this highly-favoured island, and under his skilful direction, it was still further improved by all that art could accomplish. In agriculture, Mr. Barclay felt considerable interest, and was always ready to try any experiments which might lead to useful results. But in his garden he took the greatest delight. A long range of houses, which already existed on Mr. Barclay's coming to occupy the place, were kept up as a green-house and conservatory; and to them were judiciously added hot-houses, upon the most approved principles, wherein were cultivated, with a success that does Mr. Cameron, the gardener, no less than his employer, the highest credit, the most rare and beautiful productions of

Asia, Africa, and America. Near the mansion, and communicating with it by an arcade, in which stood oranges, lemons, and myrtles, loaded with flowers and fruit, was another conservatory, where the plants of more temperate climates were judiciously selected from the general collection, so that, even in winter, there might be seen a constant succession of the choicest blossoms. There the *Camellia* and the *Indian Chrysanthemum* displayed their endless varieties. In the open borders of the garden, besides numerous plants derived from countries whose latitudes are similar to our own, the visitor was struck with a great profusion from latitudes bordering on the Tropics; which, during the summer season, flourished in a peat soil and in sheltered situations, as if they were in their native regions. Many Mexican plants were thus treated, especially the *Maurandia Barclayana*, whose numerous lovely-hued blossoms, backed by the abundant and vigorous foliage, showed how well both the climate and the soil were suited to its nature.

The gardens at Buryhill were not thus richly stored with plants, except through the medium of a most extensive correspondence. From Mexico, Mr. Barclay received frequent and important communications, as well as from Peru and Chili. With Dr. Fischer of St. Petersburgh, he held a constant intercourse by letters. But the individual through whom Mr. Barclay's gardens derived their choicest treasures, was unquestionably Charles Telfair, Esq. of the Mauritius, who has rendered the most important services to humanity and to science, by his residence in that fertile spot. Not only were seeds and roots of the native plants of that Island frequently transmitted; but also vegetating fruits of the famous *Coco de Mer*, (*Lodoicea Sechellarum*,) or *double Cocoanut*, from the Seychelles Islands, the *Colombo-root*, which yields so precious a medicine, and the *Telfairia pedata*, a cucurbitaceous plant, whose seeds are esculent, and also contain an abundant oil: the two latter from the East coast of Africa; with the *poison Tanghin*, and innumerable other novelties from Madagascar. Nor were Mr. Telfair's communications

confined to Botanical objects, the seas were ransacked for shells and corallines; and birds and quadrupeds, both living and dead, were equally transmitted to Mr. Barclay; and such of them as Mr. Barclay did not wish to add to his own Museum, were liberally presented by him to the Zoological Society. Thus possessed of great vegetable riches from the most remote quarters of the globe, it was his pleasure, and his pride, too, to render them available to others; so that there is not a collection of any value in Britain, which is not indebted for some of its chief attractions to Mr. Barclay. In particular, he was anxious that they should be described and figured. He kept an artist, almost constantly employed in representing the new or rare plants which bloomed in the Buryhill gardens; and their number is so great, as to have filled several volumes: but it afforded their possessor still more gratification to have them represented and described in some publication. Hence it is, that I am indebted to him for so many of the species figured in the Botanical Magazine, and every similar work owes him a similar debt of gratitude. It would require too much space to enumerate the many desirable plants which his zeal has introduced into this country and his liberality distributed; so that our gardens, stoves, and green-houses, owe to him some of their chief ornaments. It will be sufficient to mention here the *Erythrolæna conspicua*, and many other Mexican species; the *Hibiscus liliiflorus*, the *Thunbergia alata* and *angulata*, the *Hunnemannia fumariæfolia*, *Clerodendron emirnense*, *Poinciana regia*, *Arum campanulatum*, *Leschenaultia formosa*, and *L. oblata*, *Argemone grandiflora* and *A. albiflora*, and *Chelone atro-purpurea*.

Aware how little Botany or any science could be successfully cultivated without books, Mr. Barclay, to a library already well stored with general literature, added a very extensive collection, purchased for him in Spain, by the late Dr. Shuter. This was particularly rich in works of Natural History and Botany, and in this latter department he possessed himself of every publication that could illustrate his favourite pursuit; so that his library may be reckoned among the

most important, as a Natural History Library, in the kingdom. The excellent Dr. Wallich, whilst resident in India, dedicated a genus of the splendid natural family *Nymphæaceæ*, which he found in Pegu, to Mr. Barclay, in a letter to H. T. Colebrooke Esq., that was published in the 13th volume of the Linnæan Transactions.

In a spot, lovely as Buryhill, and in every respect so congenial to the taste and wishes of its possessor; engaged in pursuits that could not but tend to sweeten the occupations of a serene and peaceful existence; and employed, too, in every good work that might aid in bettering the condition of the poor and in alleviating pain and misery,—pursuits that, however important to others and to himself, it does not fall to my province here to detail, but by which he will long live in the recollection of the neighbourhood, as well as in distant countries,—Mr. Barclay passed the latter years of his life in the enjoyment of an unusual share of health, and surrounded by a numerous family. In the summer of the present year, his strength began to decline, and on the 22d of October, 1830, his children had to bewail the loss of a most valuable and generous parent, and the public of an eminently useful member of society.

A strong and highly interesting testimony to Mr. Barclay's usefulness arrived only the day after his decease, from the Mauritius, in a letter from his and my constant friend, Mr. Telfair. Like so many other communications from that inestimable correspondent, it was destined for the perusal of us both. The present Mr. Barclay, therefore, kindly transmitted it to me, and I then solicited permission to add it to this short notice of one, whose friendship I had long possessed, and whose correspondence and society were to me sources of the sincerest pleasure.—*W. J. H.*

PORT-LOUIS, MAURITIUS, *June* 28*th*, 1830.

MY DEAR FRIEND,—I have received, within these few days, your most kind and welcome letters of the 31st Dec. 1829, and 18th January, 1830, and 3d of February, together with all those valuable parcels, with which your munificence

incessantly furnishes us, and with which no other family, nor person in this Island, has yet been supplied. For the last twelve years, we have been indebted to your liberality for an exact knowledge of the progress of the human mind; not only in science and the arts, but in moral and religious feeling: and the light you have communicated, we have endeavoured to diffuse in our little sphere. The extensive influence of good deeds cannot be estimated. In sending me your fine plants, and fruit-trees, and flowers, you did not contemplate the blessings you were then communicating to the great Island of Madagascar; where your apples, pears, and plums, are now in great abundance in the markets of the capital, and add to the subsistence, as well as the luxuries of a numerous people, and to the countless generations which will succeed them. In our little Island, too, it is to you we owe the origin of that taste for the cultivation of natural science, which, by its diffusion among the higher classes, has enabled us to establish Professorships of Natural Philosophy and Botany, and to form a Society of Natural History, that may, before long, contribute, in some degree, to extend the bounds of that science. You have thus been the cause of a great mass of human happiness. To me, our correspondence has proved a source of unmixed pleasure and satisfaction, and I return to it with joy, from the turmoil of polemical discussion, from which even my obscurity could not shelter me, with the passionate zealots of the day. I send you, by the Georgiana, in charge of Dr. Wilson of the Navy, a new Testament and Catechism in the Madagese language, printed at the capital of that great Island a few months ago, and which has just arrived. The articles of Natural History are embarked on board the Lady Flora, Capt. Fayrer, who sails in a few days. He is a member of the Zoological Society, and a very zealous Naturalist, and will take the greatest care of them. I promised him an introduction to you, which I shall give him before parting. I think you will find the *Porcupine* a great beauty; it has grown very rapidly with me, and I never saw one so large or so brilliantly decorated before. The *Wombat* is still

more rare, and its habits less known. It is as fat as a hog, and as large; very powerful, although perfectly quiet and gentle. These animals, however, you will probably give to the Zoological Society, and I must send you something more suitable to your own cabinet, for the Mauritius museum. I have got a magnificent Birmese MSS. for you, which will go by Captain F. also; and some rare Madagascar reptiles, besides drawings and specimens, of which a list shall be made out, to be enclosed in my letter.

What a splendid work is that of our friend Wallich! Science never had before so magnificent an oblation laid upon her shrine. Mrs. Telfair and Mr. Bojer are delighted with the kind notice taken of their drawings by our friend Professor Hooker and yourself. These praises, from persons they esteem so highly, excite them to greater efforts, and I hope the drawings you will receive by the Lady Flora, will be no less worthy of your indulgent criticism. Your beautiful supply of drawing-paper will soon be commenced upon: the former was not yet exhausted, but part had suffered from humidity; the last is perfect. I was sorry to learn that the great tortoise you gave to the Zoological Society had died. Probably they had not adopted the plan of allowing him to bury himself out of the reach of winter's cold, in the garden. The one I sent you last may serve perhaps to replace him; and I would advise that he should have a dry spot chosen for his winter residence, in a warm part of the garden, under a shed, to keep off the rains and snow, that the earth may be light and friable, so that he may make his way into it without great difficulty, and the whole to be covered over for some yards, on each side, with a heap of fermenting manure from the stable. Here he would remain in a torpid state, during the coldest months, and return to the surface when the genial warmth of Spring set in. Pray, thank the excellent Wallich for the care he has taken in selecting a copy of his work for me. It is a new glory to the British nation and to the reign of George IV., and a splendid monument to his own fame, and those his labours have immortalized. This Island is the voyagers'

resting-place in the great highway that connects the nations of the East and West. There is a constant and countless succession of visitors, like wave succeeding wave, that touch our shores and pass on. Many are men of talents and acquirements, and I receive all of distinction. Wallich's work is what strikes them as most worthy of admiration, and I am proud of having it to show them. It will give an immortal impulse to the study of Botany, wherever it reaches.

I send you a germinating *Coco de Mer*, by the Lady Flora. Do not despair of it; for the vegetation is so slow in making way through its shell of flinty hardness, that it is sometimes twelve months in the ground before it comes up. It should be but lightly covered with leaves, letting the shell lie in the earth not more that one half of its depth.

Wallich's old friend, the Hon. Mr. Gardner, is just arrived, and I shall call on him and show him such attention as Wallich's friends deserve at my hands. He shall see our garden, and, above all, he shall see the plants of his own India, published by his friend. I shall endeavour on this occasion to write to our good friend, Professor Hooker: some of the specimens are for him; but all are to your address, and, of course, wholly at your disposal. Mr. Bojer's new plants will be interesting to him, and may perhaps appear in some of his publications.

Charles Telfair.

MR. BURCHELL'S BRAZILIAN JOURNEY.

This intelligent and persevering traveller, and accomplished Naturalist, so well known by his valuable "Travels in Africa," has recently returned from Brazil. In the early part of the year 1825, he had planned out for himself a very extensive journey across the Continent of South America, from Rio to Peru, and returning by Mendoza and Buenos

Ayres. With this view, Mr. Burchell left England in March, 1825, passed two months at Lisbon and its vicinity, and landed, in July, at Rio de Janeiro, which he did not finally quit till September, 1826. During that period, he collected largely in Botany, Entomology, Geology, &c.: made astronomical, philosophical, and geodetical observations, together with several drawings of the country, and, among others, a panoramic view, taken from the middle of the city; he also visited a part of Minas Geraes. From Rio, Mr. Burchell proceeded by sea to Santos, where he remained three months, exploring the neighbouring districts. Cubatao was his next station, in a solitary hut in the midst of forests, with a view to investigate the productions of the great range of mountains, at the foot of which it stands, and to examine the chain at his leisure: there he remained two months. At the city of San Paulo, nearly under the tropic of Capricorn, our enterprising Naturalist found abundant employment for seven months, making that place his head-quarters, and extending his researches in various directions from thence. There Mr. Burchell engaged muleteers and purchased mules; and, travelling northwards, finally fixed himself for nine months at Goyaz, being the first Englishman that had entered that province: there, too, he passed the rainy season of 1827, and made large collections, partly detained by the difficulty of procuring conveyance for his luggage. In a letter we had the gratification of receiving from him, dated Goyaz, April 25th, 1828, he says, "I have now for five months carried on a series of observations. The Botanical part of my collection already includes more than 5000 species, and the last number of my American *Catalogus Geographicus* is 7063. The Entomological portion is eight or nine times as large as my African collection was; and all the other departments are considerable, excepting the *Mammalia* and *Fishes;* and if I am equally successful on the road between this place and Para, I may yet add two or three thousand more species to my herbarium; and to the other parts in proportion. Although my progress over this Continent has not been rapid, yet I have kept my original plan always in view, and had

advanced thus far on my way to Peru," &c. Intelligence of the declining state of a beloved parent's health, induced our friend to sacrifice his own inclinations and his ardent thirst for science to filial duty. He could not have accomplished the Peruvian journey but by an absence of several more years from his friends; and he therefore altered his plans, and instead of terminating his travels at Buenos Ayres, decided on proceeding to Para, and thence embarking for England. This, too, was necessarily a work of time. "The conveyance of collections, baggage, and instruments, over a country like this," says he, "is attended by difficulties that nothing but patience can overcome; especially as I travel in the same solitary, unassisted manner as in Africa. How different are the features of nature in South America and in the Highlands of Scotland! I often think of the pleasant excursion we made there together. In this country of illiteracy, no one is found to whom notions of science are intelligible. Here nature has done much—man nothing: here she offers him innumerable objects of admiration and study, and strews gold and diamonds beneath his feet, yet he continues vegetating in the darkness of ignorance and in extreme poverty, the consequence of laziness alone."

Mr. Burchell still journeyed northward from Goyaz, and in November, 1828, reached Porto-Real. Here he remained till the proper season for embarking and descending the river, (which is at all times rendered dangerous by numerous rocky falls, rapids, and whirlpools,) making considerable collections on ground over which no scientific traveller had ever passed. He completed a survey of the whole length of this voyage, fixed by numerous astronomical observations, and finally arrived at the city of Para, in June, 1829, where he waited till the following February for a convenient opportunity of embarking for England.

In a letter written to us from Fulham, dated October, 1830, he says, "I hope that the time will soon come when I may enter upon the great and interesting task of arranging my collections. For I now possess about 15,000 species of plants, all gathered by my own hands in their natural places

of growth, in various parts of the world. I say nothing about the other parts of my collection, which are each of them proportionably extensive.

"The most numerous *Natural Order* of plants in Brazil, (that is, from the tropic of Capricorn to the Equinoctial Line, the northern limit of my travels,) is the *Compositæ.* Then follow the *Gramineæ, Rubiaceæ, Malvaceæ, Melastomaceæ, Myrtaceæ, Leguminosæ, Orchideæ, Terebinthaceæ, Euphorbiaceæ, Cyperoideæ, Aroideæ, Malpighiaceæ, Acanthaceæ, Bignoniaceæ, Convolvulaceæ, Apocineæ, Scrophularineæ, Solanaceæ, Scitamineæ, Guttiferæ, Bromeliaceæ, Urticeæ, Salicariæ, Annonaceæ, Tiliaceæ,* &c. These, though mentioned rather at random, will give you an idea of the Botany of my Brazilian Journey. It is remarkable, that I scarcely found a single representative of the Order *Cruciferæ.*

"According to an account, kept in my Geographical Catalogue, during my Brazilian Travels, I find I have 7022 species, including a few I collected in Portugal, Madeira, and Teneriffe."

A general sketch or picture of the vegetable forms is given in another letter, written at Fulham in December, 1830. "You have from all quarters heard the most animated descriptions of the luxuriance and richness of the vegetation of Brazil; and with them I warmly agree. But this is become almost a fashion, and in Europe it seems the general opinion that the *whole* of that country is clothed with the most magnificent forests, and of gigantic growth. This idea, though correct with respect to all the maritime districts, the courses of the rivers, and the greater part of the country lying under the Equinoctial Line, is, however, not at all applicable to vast tracts in the provinces of San Paulo and Goyaz. There I have traversed boundless plains or open regions, some of them covered with fine pasture, formed by a vast variety of the most interesting *Gramineæ;* others with grasses, intermingled with small plants and shrubs of the fine-leaved *Melastomaceæ,* the *Malpighiaceæ,* the herbaceous *Rubiaceæ,* and *Compositæ;* others with a varied clothing of annual and perennial flowers, (almost disappearing during the dry season,) faintly

shaded or protected by extensive groves of low trees, of singular and stunted growth; rarely growing so close together as to form a thicket or impede the traveller. These arid groves have sometimes reminded me of the *Acacia* groves so predominant over the plains in the interior of Southern Africa. Yet it is rarely that one can compare African with Brazilian Botany; their character, in many particulars, differs so widely: but I was a long time in Brazil before I saw such large trunks of timber as I have observed in some of the forests of the Cape Colony. I allude to the *Podocarpi*. These forests are, indeed, of no extent, compared to those of America: but they afford specimens of sylvan scenery for the painter not less grand and beautiful; although they are generally deficient in that most splendid and noble feature, the *Palms*. When, however, we descend towards the low latitudes of Brazil, the glorious magnificence of the forests is truly astonishing, and none but those who are born in the midst of them can view such imposing productions of nature without a feeling of awe or respect. She overloads herself, and one object oppresses and smothers another in the general struggle for luxuriance. The *Bertholletia*, and some species of *Bombax*, far overtop their vegetable brethren; and the trunks of the latter are really stupendous, both in height and thickness. I say nothing of the great climbing plants, as they have been lately so often described; but we never can be silent with respect to the *Palms;* they abound in every latitude and situation, and their variety is far greater than any one traveller can form an idea of. They are of every size, from that of an ordinary herbaceous plant to that of the highest tree of the forest; but I think none surpass the *Buriti* or *Miriti*, (*Mauritia vinifera, Mart. tab.* 38.) in grandeur and imposing beauty: although the plate does not convey an idea of this character. Another plant of most extraordinary aspect and magnificence is the *Araucaria;* but this I never saw much to the northward of the city of San Paulo. It is only found at a great elevation, and I believe is not known to exist in the provinces of Goyaz and Para. You ask whether the *Barbaceneæ* abound. Of these I have found but few, (if I recollect right,) but the

Vellosiæ, their nearest relations, cover whole plains in different latitudes in the interior; never in the forests. They give a singular and strange character to the landscape, not to be represented but by the pencil: they resemble some *Dracenæ*. The *Melastomaceæ* are found every where, and in every situation. The *Vochisiaceæ* are numerous, and many are most beautiful flowering-trees, and afford excellent timber; they also affect various localities, as likewise do the *Myrtaceæ*. The *Laurineæ* are numerous, particularly to the southward; but in Para are species producing the finest *Cinnamon*, and a kind of *Nutmeg* is also found there."

OBSERVATIONS ON SOME BRITISH PLANTS, PARTICULARLY WITH REFERENCE TO THE ENGLISH FLORA OF SIR JAMES E. SMITH.—By W. WILSON, Esq.

[*Continued from Vol. I. p.* 339.]

14. Scirpus *cæspitosus.*—Cheshire, May 8, 1827.—I do not find the 6 bristles at the base of the seed to be *forked.* The *stem* is always slightly compressed, and strongly striated.

15. Scirpus *pauciflorus.*—Wales, June 19, 1826.—*Bristles* with deflexed spines. The *root* sends out jointed runners. *Stems* often 6 or 7 together, from the crown of each root.

16. Scirpus *fluitans.*—July 4, 1828.—*Stem* alternately branched, compressed, each branch with a sheathing *leaf,* inclosed in a 2-ribbed, membranous, ovato-lanceolate sheath, at first tubular nearly throughout, but subsequently torn. *Seed* obovate, compressed, scarcely, if at all, keeled on the back, covered with a beautifully reticulated skin: *embryo* at the base of the seed, immersed in the *albumen;* no bristles. *Style* deciduous, very short; outer glumes generally, if not always, abortive.

17. Scirpus *lacustris.*—Anglesea, July 26, 1826.—*Fruit*

broadly-ovate, flat on the inner side, keeled on the outer, or triangular with three flat sides, dark-brown and polished, one or two of the bristles winged or dilated at the base. *Stigmas* often 2 only. The *spikelets* more elongated than in *S. glaucus.*

18. Scirpus *glaucus.*—Anglesea, July 16, 1826.—*Seed* considerably smaller than in *S. lacustris,* and more tapering above, elliptical, though slightly thickened above, visibly compressed, flat on the inner side, convex, but not keeled externally, slightly beaked, light-brown, not shining. I have not seen more than 5 rough bristles at the base of the seed:—doubtful if a distinct species.

19. Scirpus *setaceus.*—Anglesea, July 8, 1828.—*Stems* tufted, repeatedly branched or subdivided; leaves channelled and keeled, hollow, sheathing at the base. *Seed* nearly round, scarcely triangular, not furrowed, reddish-brown, granulated, covered with a closely adhering skin.

20. Scirpus *maritimus.*—Anglesea, 1826.—4 rough bristles at the base of the flower, 3 of them at the exterior base of the much broader filaments.

21. Eleocharis *palustris.*—Anglesea, July, 1828.—*Root* creeping, *black and shining,* as well as the external sheaths of the stem. *Bristles,* in the flower, only 4, longer than the ripe seed, flattened, dilated at the base, and broader than the filaments. *Receptacle* elongated below the insertion of the filaments, so that the flower appears to be not quite sessile, as it is in *E. multicaulis. Germen* shorter and broader than in the allied species, and the *style* also shorter.

The section of the *stem* is different from that of *E. multicaulis,* without any central pith, but with large membranous tubes, surrounded by smaller ones.

22. Eleocharis *multicaulis.*—Anglesea, July, 1828.—*Root* not creeping. *Sheaths* of the stem brown, not shining: the *stems* are always inclined, and frequently bent, sometimes almost prostrate. *Bristles* 6, shorter and narrower than in the other species, the base not dilated; they are shorter than the ripe seed: the *receptacle* elongated above the insertion of

the filaments: hence the *germen* seems to be attenuated below. *Stem* with a stout central pith, with membranous tubes of looser texture interposed between it and the external part. Some of the *bristles* in the flower seem to be attached to the receptacle higher up than the base of the filaments, but still three of these *bristles* are at the exterior base of those filaments.

23. Eriophorum *polystachion.*—In this, the *stalks* of the *spikes* are smooth, and evidently compressed. Except in the broader leaves, it hardly differs from *E. angustifolium.*

It is very doubtful whether any real difference exists between *E. polystachion, angustifolium,* and *gracile.* I saw them all growing together in Wales, and sought carefully, but in vain, for characters. Assuredly none exists in the fructification, for they agree most exactly in every respect but the length of the *seed-down.* It is true that in *E. polystachion* the *root* does not seem to creep as in the two others, but this is with difficulty determined, since the plant grows to a great depth in the bogs, and no ordinary methods will extract the root in a perfect state: it is not improbable that *E. polystachion,* if planted in a different soil, would throw out creeping shoots like the others.

24. Eriophorum *pubescens.*—Anglesea, June 4, 1828.—Often taller than *E. polystachion,* and the leaves always much broader in proportion, so as to be nearly lanceolate, with a very short triangular point. *Stalk* of the *spikes* furrowed, rough, but not downy, with the *setulæ* pointing forwards. *Glumes* very acute, with a strong mid-rib, reaching nearly to the summit, entire, and scarcely membranous in the margin.

25. Alopecurus *agrestis.*—June, 1827, near Liverpool, (not common.)—*Stems* often branched. The *styles* become at length distinct: they do not appear very short.

26. Knappia *agrostidea.*—Anglesea, May 7, 1828.—*Stems* not very evidently angular, thickened just below the spike, covered with pellucid dots; *leaves* with a similar kind of pubescence on both sides. *Stipules* generally 4-toothed.

The *calyx* expands *before* the seed is quite ripe, (*vide Davies' Welsh Bot. contra.*) Davies is correct in saying, "that the upper floret ripens first, and the next in succession, and that the seed falls along with the surrounding corolla," whose external glume is much the larger, very abrupt, so as to be truncate and fringed at the extremity. *Stigmas* much shorter than the filaments. No *nectary* discoverable.

Several *stems* arise from the same *root;* sometimes they form a rather dense tuft.

27. Holcus *lanatus* and *mollis.*—The acute *calyx-glumes*, and the downy joints of the *stem* readily distinguish the latter species, without attending to the *awn* of the upper floret, which is apt to mislead if the plants be examined in the flowering state.

28. Melica *uniflora.*—Cheshire, May 16, 1827.—The *nectary* is peculiar, consisting of a thick, laterally inflexed, blunt, undivided *scale. Filaments* much thickened at the base. *Styles* horizontally spreading. *Stigmas* with many-branched divisions. The inner valve of the *corolla* has its edges strongly inflexed. *Sheaths* of the stem angular, the lower one rough. *Stems* bent at the base. The thickened bases of the *filaments* are permanent, and may have been mistaken for *nectaries.* This peculiarity I believe is observable also in the *M. nutans*, but am uncertain whether it exists in *M. cœrulea.*

29. Glyceria *rigida.*—Beamaris, Anglesea, June 2, 1828, (Walls.)—This grass much resembles *Triticum loliaceum*, which is found with it. The *germen, stigmas*, and *nectaries* are alike in both. Outer valve of *corolla* more obtuse in *Triticum loliaceum* than in this, which has a slight rough keel at the top: *leaves* not much different in the two, but in *Glyceria rigida* the *stipule* is rather longer, the *spikelet* narrower, and more decidedly stalked, the *calyx-glumes* shorter, and the *florets* less crowded.

30. Poa *glauca.*—Twll dû, N. Wales, July, 1826.—*Nectaries* deeply and widely notched, or rather cloven into two unequal segments. *Stigmas* not very large or evidently branched: the edge of the inner valve of the *corolla* scarcely

rough, and not easily observable. *Stems* sometimes branched. Not distinct from *P. nemoralis.*

31. Poa *nemoralis.*—Cheshire, June 7, 1827, (hedges and woods, but rare.)—I perceive no difference between this and *P. glauca,* as to the shape of the *spikelet,* and in both the outer *calyx-glume* is 3-ribbed; nor is there any difference in the *florets,* the outer *valve* in *P. nemoralis* being blunt as in *P. glauca.*

32. Festuca *uniglumis.*—Garden, June 11, 1827, the seeds from Anglesea in 1825.—No *styles* visible. *Stigmas* much branched, but not feathery. *Germen* bristly at the summit, at first turbinate, afterwards much elongated. *Stem* 4-angled, near the top.—By cultivation, this grass becomes very tall, (more than 12 inches high,) and perfectly erect: in a wild state, its stems are mostly decumbent. The description in *Eng. Fl.* very good.

33. Arundo *Phragmites.*—September 16, 1826.—Outer glume of *calyx* brownish-purple, with several ribs: inner 3-ribbed, and purple like the florets; lower *floret* (in a dwarf specimen,) without any *pistil,* but with a *nectary* of 3 scales, (the additional one smaller and opposite to the inner valve,) the other florets have a nectary of two scales, which are large, rounded, and a little dilated, sometimes very slightly notched. *Stamens* between the nectary and pistil: *hairs* of the upper florets in two opposite tufts, placed on the edges of the common stalk, immediately below the floret.

34. Lolium *perenne.*—September, 1826.—*Nectary* of 2 ovate, acute scales, not cloven or concave, very fleshy below: outer valve of the *corolla* 5-ribbed.

35. Lolium *temulentum.*—Wales, June, 1826.—This and *L. arvense* are but varieties of one species; both are found, with intermediate states, in the same field. In *L. temulentum,* however, the *stem* is smooth as well as the *sheath;* this circumstance and the difference in the shape, size, and direction of its *awn,* are the only characters visible.

36. Hordeum *murinum.*—The *calyx* of the lateral flowers very nearly resembles that of the central one. I distinguish

it more readily from *H. pratense* by attending to the *fringed* glume, and the greater length of the *awns* of the corolla of the lateral flower, than the *awns* of their calyx.

37. Hordeum *pratense*.—Near Warrington, August, 1825. —There is also in this a *bristle* at the base of the inner valve of the central corolla, as in *H. murinum;* it is about half as long as the valve. In the lateral flowers, the *calyx-valves* are not fringed, and their *awns* are much longer than those of the *corolla.*

38. Montia *fontana*.—Wales, June, 1826.—*Stem* round, dichotomously branched. *Leaves* spathulate and sessile? *Flowers* in axillary branches: *flower-stalk* at first bent downwards, but on the ripening of the seeds, erect and elongated, sometimes branched or divided.—Wales, May, 1828.—6 or 7 inches long, an ovate and rather pointed *bractea* at the base of each cluster of *flowers. Corolla*, indeed, monopetalous, but cleft on one side almost to the base of the tube, between two of the smaller segments of the limb, as if an intermediate segment were wanting. *Filaments* inserted at the base of the *segments*, not at the " base of the *corolla*." *Seed* with a lateral *embryo*, bent round the *albumen*: outer skin granulated and shining.

39. Galium *palustre*.—The transition from the smooth to the rough state of this plant may be observed on the borders of pools, and it is only in very wet situations that it corresponds with the description in *Eng. Fl.* In dry places, especially by road-sides, in Wales, where the earth has been recently disturbed, (in the neighbourhood of marshes,) it assumes the state of *G. Witheringii*, and is very luxuriant and branched. In marshes, not liable to be overflowed, and in boggy ground, it is in every respect like that described in *Eng. Fl.* under *G. Witheringii.* The *leaves* are 5 or 6 in a whorl, linear-obovate, blunt, and deflexed: the *stem* thickened above the whorl.

40. Rubia *peregrina*.—Wales, June, 1826.—*Corolla rotate*, not bell-shaped, (nor funnel-shaped as in *R. tinctoria*:) *segments*, after impregnation, spreading with convex surfaces,

concave in the newly-opened flowers. The *panicle* not always terminal; sometimes two opposite axillary branches bear the flowers. *Berry* imperfectly 2-celled: outer skin nearly black, with a staining juice, *albumen* cup-shaped, the convex part towards the outside of the berry: *embryo* dicotyledonous, curved, inclosed in the lower portion of the albumen, the *radicle* towards the edge of the cup-shaped *albumen*.

41. Sanguisorba *media?*—1825.—*Calyx* 4-leaved? *Filaments* linear, not dilated. *Spike*, in my specimen, not very distinctly oblong or cylindrical. *Stigma* more like *S. media* than *officinalis:* and the calyx not hairy. I have not examined *S. officinalis*, having no specimen.

42. Cornus *suecica.*—Ben Lawers, July 13, 1827.—*Stem* 4-sided, angles slightly winged, from a decurrence of the leaves. *Flower-stalk* also square. *Germen* covered with close-pressed hairs, like the partial flower-stalk and stem. *Calyx* fringed; *petals* reflexed, outer one acuminate. Sometimes a second *umbel* appears above the first, arising from the centre; and sometimes 4 leaves surmount the solitary umbel.

43. Parietaria *officinalis.*—Wales, September 19, 1828.—*Filaments* at first *incurved*, the *anther* adhering to their lower part, and when mature, it separates by the elasticity of the filament, which then becomes straight, and the cells of the anther are burst. *Involucrum* in two portions of about seven segments each, and between them is placed a fertile flower, whose calyx is entire, closely surrounding the pistil. In each portion of the involucre are 3 flowers, *apparently fertile*, and containing the *stamens;* yet the *style* and *stigma* are not visible, although perfect seeds are found in calyces in similar situations.

44. Potamogeton *fluitans.*—Anglesea, July, 1826.—It does, in some situations, much resemble *P. lucens*. The coriaceous floating leaves are nearly as acute as the lower ones, differing only in their firmer texture and in being stalked, their ribs, shape, and size being much the same in both. The lateral ribs are by no means separate at the base of the leaf,

but arise from various parts of the central rib; some of them one-third the length of the leaf from its base; they are from six to seven in number on each side, two of them more evident than the rest; flower-stalk *not thickened upwards.*

45. Potamogeton *lanceolatum.*—Anglesea, July 12, 1826.—Growing in a small rivulet, with a moderately swift stream; floating leaves are always found where the current is slow. The chain-like reticulations near the mid-rib are only distinguishable on the lower leaves, the floating ones being elegantly overspread with them; the floating leaves appear to be stalked,—stipules not distinctly acute.

46. Ruppia *maritima.*—Anglesea, July 1826 and 1828.—The *seeds* ripen under water, but the flowers are all raised above the water at the time of impregnation, the flower-stalk having been elongated for that purpose. I observed the fruit-stalk to be much longer than described in *Eng. Fl. Anthers* sessile, attached by their centre only, 1-celled. *Pollen* oblong, curved, consisting of a tubular membrane, inclosing three globules, the intermediate spaces, when dry, much contracted. At the base of the flower-stalk is seen a lanceolate, flat, membranous scale, of its own length. *Embryo* erect, with a narrow *plumule* (?) at the apex, at whose base, externally, appears a small round body, the use of which I cannot understand.

47. Sagina *maritima.*—Anglesea, June, 1828.—*Leaves* quite blunt, rounded at the back, not keeled. *Calyx*-segments blunt, inner ones membranous at the edges. *Capsule shorter than the calyx,* with a broad base, stalked. No trace whatever of petals. More upright in growth, and the stems more glossy than in *S. apetala,* and the flowers, fruit, and seeds larger. *Embryo* curved, lateral.

Specimens from the neighbourhood of Warrington, Liverpool, Isle of Man, &c. confirm the above account.

48. Sagina *apetala.*—Variety.—Beamaris, Anglesea, June, 1828.—This variety, growing in situations where *S. maritima* is usually found, and much resembling it, proves *S. maritima* to be a really distinct species, as I had previously thought, from having found that the seeds refused to grow in the

garden (near Warrington). *Petals* always present in this species, (obcordate, or deeply notched in the common sort,) smaller, wedge-shaped, and truncated in the variety, permanent in both, and always visible, beneath the ripe capsule, as well as the filaments. *Leaves* (in the variety) all tipped with bristles, but nearly as smooth as in *S. maritima:* the capsule on a rather shorter stalk than in that.

49. Mœnchia *erecta.*—Cheshire, June 8, 1827.—Teeth of the capsule blunt, as in *Cerastium. Stems* generally inclined.

50. Radiola *millegrana.*—1826.—Leaves very indistinctly, if at all, 3-ribbed, with scattered pellucid dots: the description in *Eng. Fl.* otherwise very good.

51. Myosotis *palustris.*—September, 1826.—*Germen* not inserted into the base of the calyx, but attached to the base of the style, subsequently swelled. In the nearly ripe fruit, the base of the style is thickened, above the insertion of the germens, and enlarged below, being then somewhat companulate, and four-sided. I hardly think *Schrader* correct in terming it a receptacle, since the style is thickened as well above as below the seeds, and hence appears to be one continuous body. This observation applies to the *Generic Char.*

Corolla in *M. palustris,* with five prominences, hollow beneath, at the interstices of the limb, the segments of which are not ribbed.

52. Myosotis *sylvatica.*—May 8, 1827.—The part to which the seeds are attached is flat, not prominent, and agrees better with the *Generic Char.* in *Eng. Fl.*

53. Myosotis *alpestris.*—Ben Lawers, July, 1827.—*Stem* angular, the *limb* of the *corolla* not much longer than the *tube.*

54. Myosotis *arvensis.*—September, 1826.—*Segments* of the calyx much longer than the tube, and they are clothed in the lower part, like the tube, with hooked bristles. *Tube* of the corolla much widened at the base, and closed, at the base, with ten teeth, just above the germen. *Seeds* polished and keeled, dark-olive-coloured; the axillary flowers often wanting. *Anthers* triangular? with a blunt horn at the

summit: receptacle of the seed, or tumid base of the style, depressed.

55. Lithospermum *officinale.*—Wales, June 11, 1828.—*Leaves* with lateral veins. *Tube* of the corolla closed with five roundish teeth, (hollow underneath,) constituting the "protuberances at the base of each segment;" they are not placed at the sinus, as in *Myosotis.* *Segments* of the corolla notched at the summit.

56. Lithospermum *arvense.*—Gloddarth, June, 1828.—Scarcely any prominence at the base of the segment of the corolla, and such as is visible is only a termination of the elevated lines of the inside of the tube. *Seeds* spreading, as well as the enlarged calyx: hairs of the leaf strong and appressed. *Corolla* externally hairy; segments of the limb entire.

57. Lithospermum *maritimum.*—Llandudno, June, 1828.—*Leaves* of the stem too narrow to be termed "ovate," the radical ones are, however, of that shape. *Stem-leaves* generally recurved. *Segments* of the calyx keeled, with reflexed margins, so that the calyx, when unexpanded, appears to be prismatic: the hollow protuberances are found at the base of the segments of the corolla. *Seeds* not evidently keeled.

58. Anagallis *tenella.*—July, 1828.—*Stamens* connected at the base, where they form a tube, and clothed, at the back only, with jointed hairs, from the middle upwards; these jointed hairs are clubbed at the extremity, and round each joint are four or five knobs; the lower part of the filaments is bare; and the tubular base is connected with the tube of the corolla; both falling off together.

59. Viola *hirta.*—April, 1827.—There is indeed, as Professor Henslow observes, a very great resemblance between this and *V. odorata*, the principal difference lying in the short side-shoots, or runners, of *V. hirta*, which do not take root. In *V. odorata*, the hairs of the flower-stalks and leaf-stalks are deflexed, the calyx-leaves more evidently fringed, and I think not 3-ribbed, as in the other species; the hairy line on the

lateral petals is the same in both; the germen of *V. odorata* is hairy, in the other species almost smooth.

60. Viola *palustris.*—May, 1827.—*Stipules* fringed, not serrated, (I think,) but nearly entire, as stated in *Eng. Fl.* Lateral petals with a purple central line, *not hairy;* the petals, however, are slightly hairy on one side, near the base.

61. Erythræa *pulchella.*—Anglesea, July 15, 1828.—*Anthers* very short. *Segments* of the calyx strongly keeled, very deep in proportion to the tube. Herbage very smooth.

62. Samolus *Valerandi.*—July, 1828.—*Filaments* very near the base of the tube of the *corolla.*

63. Rhamnus *catharticus.*—June, 1827.—In the barren flower, the tube of the calyx is *campanulate,* segments ovate, 3-ribbed. *Petals* (4) oblong-ovate, inserted just below the mouth of the calyx, alternate with its segments. *Stamens* inserted just below the petals: there is an abortive germen visible. In the fertile flower, the petals are linear, incurved above. *Stamens* abortive. *Styles* 4, united half-way up, spreading. *Stigmas* small, slightly decurrent along the inner edge of the styles: *germen* superior.—October, 1826.—The *seeds* are ovate, acute at the lower extremity, rounded at the back, with two flat sides, forming the internal angle. *Embryo* with kidney-shaped *cotyledons* laterally bent, surrounded by the *albumen.* I thought I saw two skins, within the hard external one, and the latter seems to split at the internal angle. Serratures of the leaf very close and regular, rounded and glandular; *ribs* of the leaf prominent on the lower-side, furrowed or depressed on the other.

64. Rhamnus *Frangula.*—June, 1827.—*Flower-stalks* and *calyx* generally downy, also the *ribs* on the back of the *leaf.* *Anthers* white. *Style* very short.

[TAB. LXXVI.]

HOLBOELLIA ORNITHOCEPHALA.

TRIANDRIA MONOGYNIA? Nat. Ord. GRAMINEÆ.

GEN. CHAR.—HOLBOELLIA. (*Wall. MSS.*)—*Flores* racemosi, monoici v. polygami. *Pedicelli* basi geniculati. *Gluma* nulla. *Perianthium* uniflorum, bivalve. *Valvæ* inæquales, carinatæ, pectinato-ciliatæ; *exteriore* majore basi superne insigniter gibbosa, *interiore* sub apicem unidentata. *Semen* basi superne gibbosum perianthio cartilagineo tectum.

Holboellia *ornithocephala.* (TAB. LXXVI.)

Gramen perelegans. *Radix* annua, fibrosa, fibris flexuosis, pallidis, subsimplicibus, non raro tomentosis. *Culmi* subcæspitosi, spithamæi ad pedalem, plerumque ad basin subdecumbentes, dein erecti, foliosi, vaginati. *Folia* lineari-lanceolata, bi-triuncialia, rigidiuscula, flexuosa, undulata, acuminata, glabra, pulcherrime striata, marginibus cartilagineo-albis, antrorsum scabris, inferne caulem longe vaginantia: supremo ad basin racemi. *Racemus* terminalis, simplex, digitem longus, lineari-cylindraceus, erectus, multiflorus. *Rachis* stricta, striata, scabriuscula. *Pedicelli* sesquilineam longi, scabriusculi, sursum incrassati, utrinque ciliati, inferne ad rachin articulati atque geniculati. *Flos* singularis atque capiti avis fere exacte emulans. *Gluma* nulla. *Perianthium* bivalve, simplex; valvis lateraliter compressis, minute elevato-punctatis, acute carinatis, tricristatis, crista e membrana cartilaginea diaphana, pulcherrime pectinato-ciliata: *valva exteriore* bicristata, ciliis apice uncinatis, basi insigniter gibbosa, galeæformi: *inferiore* multo minore, sub apicem dente unico, valido instructa, subtus unicristata, ciliis apice vix uncinatis. *Pistillum* stylis plumosis. *Semen* perianthio indurato nigrescente tectum, oblongum, subacuminatum, basi superne gibbosum, inferne depressum.

Hab. In India orientali; apud montes Maduræ. *Koenig.—Wight, M. D.*

The very remarkable and beautiful grass here figured, was sent to me by Dr. Wight, in one of his many valuable communications, from the East Indies. It was marked, "the most curious of an interesting and extensive natural family. The accompanying specimens were gathered by Koenig. I also found the same plant, but do not at present recollect the habitat. I think it was in the mountainous parts of the Madura district." When I came to examine these specimens, with the view to their publication, I was mortified to find that those most singular flowers, which so much resembled birds' heads, contained nothing within them; except, in some instances, a small body, which may perhaps be considered the abortive organs of the flower, and in one, where I saw feathery stigmas, but less distinctly than I could wish.

I consulted Dr. Wallich, wishing to know if he had specimens of the grass in his immense herbarium, and whether, if it should prove new, it might not with propriety bear the name of our mutual friend, Dr. Wight. In reply to the former question, I had the satisfaction to learn that in Dr. Wight's department of the East India Company's herbarium, there existed very fine specimens of this grass, which, with the other *Gramineæ,* were confided to Mr. Brown's care, for examination and publication. They afforded individuals with seed, which were obligingly forwarded to me, together with the opinion, both of Mr. Brown and Dr. Wallich, that the genus was altogether new. I had the farther gratification to learn, that a noble East Indian plant, of the Nat. Ord. *Bignoniaceæ,** had just been dedicated to Dr. Wight by Dr. Wallich, who kindly suggested to me that the grass in question might bear the name of his late friend and preceptor, Mr. Holboel, † who was gardener at

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* See the *Plantæ Asiaticæ Rariores, t.* 81.

† The former *Holboellia* of Wallich, is now ascertained to be a species of *Stauntonia;* its affinity to which was alluded to, when it was published in the *Tentamen Floræ Nepalensis Illustratæ,* Fasc. 1. p. 23. "Genus," says Dr.

the Royal Botanic Garden of Copenhagen, "an excellent practical botanist, and one of the best of men." I need not say what pleasure it gives me to be the medium of making the genus public.

I feel very incompetent to speak of the affinities of this grass; partly owing to my limited acquaintance with Exotic Grasses, and partly because my specimens are not in so perfect a state as were to be wished. If I am correct in considering the flower to possess only a single, two-valved, floral covering, (and I can find no trace of any other,) then the genus may be looked upon as allied to *Asprella*, Solander, (*Leersia*, Sw.): but my ignorance on these points is the less to be regretted, since Mr. Brown is charged with the publication of this and the whole of the rich collection of *Grasses* in the possession of the Hon. the East India Company;—and assuredly no one is better or so well qualified for the task.

Tab. LXXVI. Holboellia ornithocephala. Plant:—*natural size. Fig.* 1, Portion of the rachis, with a flower. *Fig.* 2, Sterile flower. *Fig.* 3, Flower, containing a pistil. *Fig.* 4, Portion of a leaf. *Fig.* 5, Side-view of a seed. *Fig.* 6, View of the underside of a seed:—*magnified.*

[TAB. LXXVII.]

SPATHICARPA HASTIFOLIA.

Monœcia Monandria. Nat. Ord. Aroideæ.

Gen. Char. Spathicarpa (*genus novum.*) *Spatha* lineari-oblonga, acuminata, subcymbiformis, marginibus involutis; intus linea media longitudinali floribus masculis et fœmineis immixtis staminibusque sterilibus lentiformibus

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Wallich, in the same place, "consecratum amico et præceptori carissimo; *Frederico Ludovico Holboel*, Horti Botanici Regii Hafniensis hortulano dexterrimo, botanico peritissimo, operi Hornemanni *Flora Daniæ Œconomica* nuncupato aliusque contributori, quique hortum Calcuttæ ditavit thesauris seminum frequentibus, amplissimis, omniumque fertilissimis."

tecta. *Spadix* nullus.—Masc: *Stamina* intermedia: *Filamenta* basi articulata, superne dilatata peltata: *Antherarum loculi* 6–8, ovales, medio poro dehiscentes. Fœm: *Pistilla* marginalia: *Germen* ovatum, 1-ovulatum, ovulo erecto: *Stylus* superne incrassatus: *Stigma* subcapitatum.

Spathicarpa *hastifolia*. (Tab. LXXVII.)

Radix a me non visa. *Folium* solitarium, radicale, longe petiolatum, hastato-trilobum, membranaceum, reticulato-venosum; lobo medio ovato-acuminato, lateralibus horizontaliter patentibus, oblongis, obtusis, subinæquilateralibus, omnibus glaberrimis, integerrimis. *Petiolus* spithamæus et ultra, gracilis, basi in vaginam latam membranaceam circumvolutam dilatatus. *Scapus* folio longior, gracilis, teres, erectus, e vagina petioli erumpens, solitarius. *Spatha* terminalis, vix digitem longa, lato-linearis, seu lineari-oblonga, subcymbiformis, basi attenuata, apice acutissime acuminata, longitudinaliter nervosa, nervis venis anastomosantibus, marginibus involutis; intus linea media longitudinali florifera. *Flores* nudi, *masculi* et *fœminei*, cum staminibus sterilibus lentiformibus immixti. *Stamina* mediam partem lineæ floriferæ occupantia. *Filamenta* tuberculo parvo convexo articulata, peltata, carnosa, apice tri-rarius-quadrangulari, truncata, paulo infra marginem antherifera: *Antheræ* 6–8, discretæ, liberæ, ovales, pallide-flavæ, subcarnosæ, medio poro solitario dehiscentes. *Pistilla* marginalia. *Germen* ovatum, glabrum, stylo subæque longo apice incrassato: *Stigma* obtusum, subcapitatum. *Fructus: Bacca,*—vix matura, ovato-globosa. *Semen* unicum ad basin loculi, erectum, ovatum.

Hab. In America meridionali, prope flumen Uraguay. *D. Jacobus Baird.*

It was not till I examined, with some degree of care, the fructification of this plant, that I recognized any thing remarkable about it, or any thing that would indicate a structure different from that of other *Aroideæ*, or even of *Arum* itself. It was then, however, that I perceived there was no *spadix*,

and that the naked flowers were seated in a line upon the inner surface of the spatha itself, and on that part of it which appeared to correspond with 3 nerves which are more conspicuous on the back of the spatha than are the rest. Again, I found the filaments of the stamens distinctly jointed upon a tubercle, from which they readily fall off; and these, as well as the sterile stamens (or peltate fleshy glands) occupy the central portion of the line of flowers, the pistils being arranged along the outside of the line. From these, and other characters, I am induced to form a distinct genus of this plant; —*Spathicarpa;* a name intended to convey its most striking peculiarity; the *spatha* bearing the fructification. The term *Spathantha* is already applied to another genus, or I should have preferred it.

I have figured and described the *Caladium Seguinum* (*Exot. Fl. t.* I.) as having the lower part of the spadix united to the spatha, which may be considered an approach to the structure of the present genus.

Tab. LXXVII. *Fig.* 1, Portion of the spatha, with flowers. *Fig.* 2, Back of a portion of the spatha. *Fig.* 3, Stamen. *Fig.* 4, Cell of an anther. *Fig.* 5, Tubercle, from which a stamen has fallen. *Fig.* 6, Pistil. *Fig.* 7, Seed:—all more or less *magnified.*

[TAB. LXXVIII.]

JUNGERMANNIA BERTEROANA.

J. Berteroana; caule subsimplici erecto, foliis bifariam imbricatis horizontalibus inæqualiter bilobis, lobis verticalibus anguste seu oblongo-ovatis, majori spinuloso-dentato, minori majoris lobi paginæ affixo integerrimo, stipulis parvis quadratis emarginatis integerrimis. (Tab. LXXVIII.)

Hab. Ad saxa, locis udis muscosisque secus rivulos in sylvis

montium editiorum Ins. Juan Fernandez, 1830. *D. Bertero.*

Radix densissime tomentoso-radiculosa. *Caules* " in cæspitem rosulatum dispositi, basi decumbentes, diaphani, glabri," (*Bert. in litt.*), vix digitem longi, erecti, plerumque simplices, dense foliosi. *Folia* bifariam imbricata, horizontalia, pallide viridia, areolis minutis reticulata, biloba, lobis conduplicatis, verticalibus, inæqualibus; *posterioribus* majoribus, pulcherrime ciliato-serratis, *anterioribus* paginæ majoris lobi, versus ejus medium, per totam longitudinem affixis, margine superno libero, integerrimo. *Stipulæ* in superiore parte caulis præcipue, parvæ, subquadratæ, appressæ, integerrimæ, apice emarginatæ. *Antheræ* axillares in foliis supremis, in globum congestæ, parvæ, sphæricæ, reticulatæ, sublonge pedicellatæ. *Fructificatio* fœminea non visa.

Tab. LXXVIII. Jungermannia Berteroana. *Fig.* 1, Plants:—*natural size.* *Fig.* 2, Extremity of a plant, with anthers. *Fig.* 3, Front view of leaf of the same. *Fig.* 4, Leaf, seen from the back, with stipule. *Fig.* 5, 6, Anthers:—more or less *magnified.*

This belongs to a small and very remarkable groupe of *Jungermanniæ*, characterized by the lesser of the two complicated *lobes* not being attached to the margin of the larger one, but arising from the centre of its anterior surface or pagina. They are inhabitants of various countries, both intra and extra-tropical, and the first that was made known to Botanists (*J. appendiculata, Musc. Exot. t.* 15,) was detected by Mr. Menzies at Dusky Bay, New Zealand. *J. Thouarsii* is a native of the Isle of France; *J. Blumii* and *J. aligera* (Nees von Esenbeck) of Java. Of these, the first is distinguished by its pinnatifid leaves; the second, by its ciliato-dentate stipules and lesser lobes to the leaves, these latter being placed nearer the upper margin of the larger one; the third, by its ciliated lesser lobes and stipules; and the last, by its truncated lesser lobes.

Our present species was gathered, along with many other new plants, by M. Bertero, in the Island of Juan Fernandez, and by him kindly communicated to me.

[TAB. LXXIX.]

CYCLOMYCES FUSCA.

GEN. CHAR.—CYCLOMYCES. *Kunze.* (Loxophyllum. *Klotzsch, MSS.*) *Hymenium* sinuoso-lamellatum, e lamellis transversis basin arcuatim ambiens, oculo armato scabriusculum, margine plerumque nunc lamellas anastomosantes nunc poros elongatos referens, cum pilei substantia homogeneum et concretum (*lamellas* ut in *Dædalea* nunquam conjunctione membrana duplici.) *Substantia* coriacea, fibrosa.—Genus *a Dædalea* satis distinctum. *Klotzsch, MSS.*

Cyclomyces *fusca.* " *Kunze.*"

Loxophyllum velutinum. *Klotzsch, MSS.*

HAB. In Insula Mauritii. *D. D. Telfair. Bojer.*

Pileus sessilis, imbricatus, basi effusus, coriaceo-tenuis, cerasino-fuscus, eleganter velutinus, zonis concoloribus, margine subpatente undulato, 2–2½ uncias latus, unciam circiter longus, lamellis transversis densis interruptis castaneo-fuscis, lineam altis, aculeis setiformibus minutissimis distantibus obtectis, subinde crenulato-incisis, margine in poros abeuntibus. *Klotzsch, MSS.*

This extremely elegant *Fungus* has been communicated to me by my liberal friends from the Mauritius. The name of *Cyclomyces fusca* of Kunze has been given to me for it; but I know not in what work it is published by that appellation; nor whether, as I suspect, it is merely in the MSS. of that author. The colour is a rich and ferruginous brown, and, from the compactness of the lamellæ, there is a beautiful play of light and shade, which gives to its under-surface a strikingly rich velvety appearance. The direction of these lamellæ is very remarkable, and though transverse with regard to the

whole *Fungus*, yet, at the base, they have a degree of curvature, which, I presume, suggested the generic name of *Cyclomyces*.

TAB. LXXIX. *Fig.* 1, Plant, seen from the upper side:—*natural size.* *Fig.* 2, Under-side of do. *Fig.* 3, Lamellæ, from near the centre. *Fig.* 4, Lamellæ, passing into large pores at the margin. *Fig.* 5, Vertical section of the lamellæ, showing more distinctly the spiculæ or setæ on their surface:—*magnified.*

[TAB. LXXX.]

GONGORA MACRANTHA.

Gongora *macrantha;* petalis approximatis, labello saccato basi utrinque plicis deflexis 4, appendice magna pedunculata galeata, columna basi bidentata.

HAB. Apud Caraccas, Am. Merid.; ubi legit *D. Lockhart.*

In the *Botanical Magazine, t.* 2755, I had the gratification of publishing a superb Brazilian parasitic *Orchideous* plant, from the collection of Richard Harrison, Esq., which, though not in all respects coinciding with the genus *Gongora,* I called *Gongora speciosa.* I have been agreeably surprised by receiving lately, from Mr. Lockhart, a flower of a closely allied species, preserved in spirits, which that zealous gardener discovered in the Caraccas, in 1828. Roots were brought by him to Trinidad, where one of them blossomed in the autumn of 1829, and bore three flowers. But so extraordinary a production was supposed, by visitors to the garden, to be artificial; the flowers were handled in the absence of Mr. Lockhart, and injured, so that only one of them was in a sufficiently good state to be preserved, and that was obligingly transmitted to me. The foliage and stem, or bulb, are described as being similar to those of *Catasetum* or *Brassia.*

I refrain from any farther remarks upon this singular blossom, farther than to say that it is principally distinguished

from *G. speciosa* by its still larger size, and the projecting deflexed plicæ, or folds, at the base of the attenuated part of the labellum; and that I have thought it deserving of being here figured.

TAB. LXXX. Flower of *Gongora macrantha* :—*natural size.*

[TAB. LXXXI. LXXXII.]

ON THE TELFAIRIA PEDATA.

OF this fine and interesting plant some account was first given by Dr. Sims, in the *Old Series* of the *Botanical Magazine, t.* 2681; and again in the *New Series* of the same publication, *t.* 2751 and 2752, by myself. The designs were partly made from plants that flowered at Buryhill, and partly from specimens forwarded in spirits, and from drawings communicated by Charles Telfair, Esq. of the Mauritius, to whom we are indebted for many important particulars, relative to the history and uses of the plant. Again, through the liberality of Mr. Telfair and Professor Bojer, we have received other and still more complete delineations, with such full and accurate descriptions, as to furnish us, we trust, with almost every requisite for its entire history.

On my own part, too, I am glad to be the medium of giving publicity to these communications, and to have it in my power to offer some remarks upon the generic name which I still retain. For, at about the same period when the plant appeared in the *New Series* of the *Botanical Magazine*, it was made known in France by Professor Delile. In a supplementary note to that gentleman's description, in the 3d Vol. of the *Mémoires de la Societé d' Histoire Naturelle de Paris*, by M. Guillemin; he shows "qu'on doit considérer les notices de M. M. Delile et Hooker, comme ayant la même date; et ce point, bien constaté, nous pensons qu'on n' hésitera pas à adopter le nom de *Joliffea;* conformément aux vœux de l' auteur primitif du genre, qui est M. Bojer." For my own part, I am disposed to go further than this, and to

say, that if my account had been published twenty years prior to M. Delile's, still, if it was really M. Bojer's wish that the name *Joliffea* should be retained in preference to any other, his wishes ought most assuredly to be fulfilled.

It will be seen, by a note appended to my description of *Telfairia pedata, t.* 2256 and 2257, that my account and name were printed, though not published, when I received M. Bojer's description of *Joliffea,* and that I retained the name *Telfairia,* "trusting that he would concur with me in dedicating it to his patron and friend."

I was, indeed, not in the least aware that *Joliffea* was so called in compliment to a person; but no sooner did I find that it was published in France, under the last-mentioned appellation, which it had received in honour of the captain of the vessel who brought it to the Isle of France, than I immediately wrote to M. Bojer, begging him to say which name, under all these circumstances, should attach to the plant, and assuring him that I should adopt, with pleasure, whichever he preferred.

His reply came in a letter, dated February 23, 1829, and is as follows:—"Now allow me, my dear Sir, to touch on the essential point of your letter, respecting the *Cucurbitaceous* plant. I know that a paper of mine, sent to my inestimable correspondent, Professor Delile, at Montpellier, is a copy of the same I sent to you, with a drawing under the name of *Joliffea;* but I never heard what M. Delile had done with it. Now I am happy to say, that if it depends upon me which appellation is to be retained, I prefer commemorating the name of a man, whose knowledge, love of science, and universal benevolence of character, entitle him to the distinction. Such a man is our excellent friend, Mr. Telfair; and I shall be very much obliged to you, to do all that is necessary to prevent any change of the name *Telfairia.* I shall write to M. Delile on the same subject."

It now only remains for me to state that the following description, and the accompanying drawings are copied from those lately communicated by Professor Bojer; and that the history of the introduction of this plant to the Mauritius, is

from the pen of M. Jean Vincent; a gentleman whose acquaintance I lately had the honour of making in London, and after whom the *Vincentia* in the *Botanical Miscellany, v.* 1. *p.* 293, *t.* 62, is named by M. Bojer.

GEN. CHAR.—FLOS MASC. *Cal.* turbinatus, 5-phyllus. *Cor.* pentapetala, campanuliformis, petalis laciniatis. *Stam.* 5 distincta, quorum 4 ad basin per paria unita. *Antheræ* simplices, æquales, trigonæ, uniloculares. *Stylus* nullus.

FLOS FŒM. *Cal.* minimus, 5-dentatus, caducus. *Cor.* 5-petala, patentissima. *Stylus* 1, brevis, trigonus. *Stigma* lobatum. *Ovarium* inferum, 10-sulcatum, basi torulosum. *Fructus: Bacca* maxima, elongata, 10-angulata, sulcata, cortice carnoso, 6-locularis, polysperma. *Semina* compressa, subrotundo-cuneata, in loculo singula serie disposita. Integumentum duplex: *ext.* longitudinaliter fibrosum; *int.* crustaceum, fusco-olivaceum.

(The following account of the species was drawn up from the living plant in the Island of Zanzibar, near the East Coast of Africa, in August, 1824.)

PLANTA MASCULA. *Radix* prostrata, digiti crassitie, carnosa, irregulariter geniculata. *Caulis* perennis, inferne lignosus, externe suberosus in planta juniore: diametro 2–4 pollicaris, scandens. *Rami* elongati, 50 ad 100 pedes longi, flagelliformes, inferne teretes, superne angulati, læte virides, glabri. *Folia* regulariter pedata, longe-petiolata; foliolis oblongo-ovatis subsessilibus, acuminatis, utrinque attenuatis dentato-repandis aut laciniatis, involutis, medio latioribus, 3–4 pollices longis, 2 pollices latis, lateralibus minoribus basi extus auriculatis, omnibus nervosis, supra viridibus lucidis utrinque glabris, subtus pallidioribus, albo-punctatis, nervis puberulis, scabriusculis. *Stipula*, corpusculum pedunculatum ex axillis petiolorum cirrho oppositum, concavum, pubescens. *Petiolus* communis teres, supra sulcatus, longitudine foliorum, glaber. *Cirrhi* e basi petiolorum laterales, bipedales et ultra, bipartiti, varie torti, glabri, demum

carnosi. *Pedunculus* axillaris, teres, 8–10 pollicaris, subasperus. *Pedicelli* terminales, breves, uniflori: *bracteolæ* ad basin pedicellorum, subpetiolatæ, subrotundatæ, profunde serratæ, pubescentes. *Flores* racemosi. *Calyx*, laciniis erectis, serratis, pulverulento-pubescentibus, cum corolla deciduis. *Petala* purpurascentia, ad basin calycis laciniarum inserta, oblonga inferne attenuata, lineis viridibus notata, crassiuscula, extus pubescentia intus papillosa, apice fimbriato laciniata. *Stamina* 5: *Filamenta* brevia, basi subgibbosa, purpurea. *Antheræ* 5, distinctæ, erectæ, crassæ, virides, basi apiceque punctis roseis adspersa. *Pollen* oblongum, linea media longitudinali notatum.

Planta fœminea. *Radix*, *Caulis*, *Rami*, *Stipulæ*, *Petioli*, *Cirrhi*, ut in planta mascula. *Flores* axillares, solitarii. *Cal.* minimus, purpureus, caducus. *Corolla* patentissima, mari similis. *Stylus* brevis, subtrigonus, exsertus. *Stigma* subcapitatum, 3–5-lobatum, pallide virescens, punctis crystallinis tectum. *Ovarium* attenuatum, 10-sulcatum, viride, verrucosum, basi torulosum. *Fructus* maximus, carnosus. *Dissepimenta* filamentosa. *Semina* pollicem lata, compressa, orbiculata, subretusa, oleosa, esculenta. In statu germinationis *Cotyledones* planæ, brevissimæ, flavescentes: *Plumula* maxima, pubescens: *radiculis* filiformibus pubescentibus.

Tab. LXXXI. Telfairia pedata. *Fig.* 1, Female flower. *Fig.* 2, Pistil, after the petals have fallen away, to show the triangular short style and the large lobed stigma. *Fig.* 4, Transverse section of the germen, showing the six cells.

Tab. LXXXII. *Fig.* 1, Bud of a male flower. *Fig.* 2, View of the same, with the cal. segments expanded, and the unopened petals appearing. *Fig.* 3, Cal. of do. and a single petal to show the insertion of the latter:—*nat. size*. *Fig.* 4, Tube of the calyx with stamens. *Fig.* 5, Tube laid open, to show more particularly the insertion of the

stamens. *Fig.* 6, Side view of a stamen. *Fig.* 7, Back view of do. *Fig.* 8, Grain of pollen:—more or less *magnified.* *Fig.* 9, Seed in a state of germination:—*nat. size.*

ACCOUNT OF THE PLANT, KNOWN AT THE ISLE OF FRANCE UNDER THE COMMON NAME OF *LIANE LEJOLIFF* (*TELFAIRIA PEDATA*:) BY M. JEAN VINCENT, ADVOCATE.

M. Lejoliff, of St. Malo, a captain in the Navy, undertook in the year 1807, a voyage to the Eastern coast of Africa, whence he brought the seeds of a plant, hitherto unknown in this Island. These vegetated quickly; but their flowers not setting, the hopes which several colonists had entertained of cultivating this new esculent, were disappointed.

The only individual plant in this town, blossomed in the second year, but all its flowers proved male; while a small number of barren fruits, produced by some female plants at Wilhelm's Plain, contained seeds, whose perisperm was entirely hollow; thus incontestably proving the diœcious nature of the species.

A hurricane destroyed all the plants in the third year. The loss of this valuable vegetable caused the more regret, because it was impossible to replace it; no one knowing either its name or the spot whence it was originally obtained. Fifteen or sixteen years elapsed before it was introduced anew.

I had communicated my notes on this curious *Cucurbitaceous* plant to my friends, M. M. Helsinberg and Bojer, two German Naturalists; who vainly sought for it in their earlier excursions to Madagascar. Captain Owen, to whom I also mentioned it, when he first visited Mauritius, and who was Commandant of the Expedition for exploring the Eastern coast of Africa, was equally unsuccessful. He, however, took on board his vessel the unfortunate Helsinberg, to whom I renewed my solicitations. At the same time, M. Bojer embarked in the Andromache, commanded by Commodore Nourse, an officer whose kindness and friendly

attentions have produced an indelible impression on his mind. This voyage had very fatal results; a fever attacked most of the individuals of the Expedition, Commodore Nourse among the number, and M. Bojer was the only person who recovered. His valuable collections were, however, lost, for want of necessary care;—those from Madagascar, from the banks of the Maronvoai, from Zanzibar, Pemba and Mombase, all perished. But at length he obtained seeds, in a good state, of the much-desired *Cucurbitaceous* plant, which he gathered at Zanzibar, where it is cultivated.

The seeds brought home by M. Bojer were distributed to more than forty persons, but only five female plants appeared among their produce. The one grown at Réduit, the country residence of the Governor, bore about a dozen fruits, which did not, however, attain to so large a size as what were seen at Zanzibar. The number of male plants was much more considerable than of female ones. The inhabitants of this country have received much advice on the subject of the culture of this vegetable: but as its produce is not so large and immediate as they would desire, it is to be feared, that, in spite of its great utility, some time will elapse ere it is generally grown. Every fruit, weighing about 60 lbs., bears from 200 to 300 seeds, each an inch in diameter, and 3 or 4 lines thick. The net produce of each fruit may therefore average 50 lbs. weight of kernels, and yield 8 lbs. of excellent oil.

The kernels are very good to eat, and were much used on board the Andromache, both raw and prepared in various ways.

The plant comes from the interior of Africa: it has been recognized by many negroes, who call it in their own language *Souali-Konémé.* When growing within reach of trees, it climbs, and soon reaches the top of the highest. Like other *Cucurbitaceæ*, it seems to prefer a light soil, and the vicinity of water. In order to obtain the greater advantage from its culture, it would be desirable to try the effect of grafting the male stems upon the female ones, and *vice-versâ;* a female plant, fecundated by M. Bojer, produced fruit at Petite Rivière.

The only female stem which grew in the garden of St. Maixent, near the town of St. Louis, having flowered earlier than some male ones that were in the same place, M. Bojer touched it with the pollen of a *Gourd*, (*Giraumon*,) but the produce was much smaller than the fruits which had been seen at Zanzibar, being only 15 inches long and 8 inches in diameter: it contained 134 excellent kernels, similar to the best grown in its native country.

The pulp of the fruit was excessively bitter, and of such a nature, that, when only applied to the tongue, it caused me a violent headache, which lasted six or seven hours, and resembled what I had experienced after tasting the bulb of a new kind of *Yam*, (*Dioscorea.*) The bitterness that pervaded my whole mouth resisted all attempts to remove it by rincing with clear water, and lasted till dinner-time, (5, P. M.) though I had tasted it at 8 o'clock in the morning.

This intense and disagreeable flavour, with the novelty of the fruit in which it resides, determined me to request M. Delisse, an able chemist, to undertake its analysis; and I anxiously expect the result.

M. Bojer intends to sow some of the fresh seeds, and to continue the fecundation of the female flowers which they may produce, with the pollen of the *Gourd*, (*Giraumon*,) in order to ascertain distinctly the produce of this hybrid fructification: he will also attempt the impregnation of the fertile blossoms of the *Gourd*, with the pollen of this new plant, and make known his observations.

The *Liane Lejoliff* has since produced perfect flowers and fruit at Bois Chéry, the residence of Mr. Charles Telfair.

[TAB. LXXXIII.]

METHOD OF PRESERVING THE FLESHY FUNGI (*AGARICUS, BOLETUS,* &c.) FOR THE HERBARIUM.—By Mr. F. J. Klotzsch.

The importance of a *Hortus Siccus* to the Botanist, is too universally acknowledged to render it necessary for me to dwell upon that subject. Without it, almost no progress can be made in systematic Botany. Hence it is we find that the *Fungi* have been so much neglected as to be the opprobrium of the science: for it has been considered scarcely possible to preserve *them* in a such a manner as to render them of service after they are committed to the Hortus Siccus. In England, especially, the Herbaria are lamentably deficient in this singular, varied, and interesting tribe of vegetables; and the species that abound so much in the Torrid Zone, are left by collectors to that state of decay to which they so naturally, and almost proverbially, hasten.

I am not without hope, then, that a method I have for some time, and successfully, practised in Germany, may be acceptable to the Botanists of this country, and be a means of rendering this department of her Flora more complete than is at present the case.

A few years since, M. Ludensdorff made known to us a plan for preparing the *Fleshy Fungi;* namely, by boiling them in mutton-fat, (which thus filled their pores and cells, and penetrated the very substance,) and then covering them with a coat of varnish: but neither did this preserve the colour nor the form; and the operation, it must be allowed, is by no means an agreeable one, nor free from trouble: add to which, they required a vast deal of space in the cabinet, particularly if placed in an advantageous and convenient point of view.

The method I have adopted, by which the *Agarics* and *Boleti* may have their characters preserved and be fit for examination in the Herbarium, is as follows:—

With a delicate scymetar-shaped knife, or scalpel, such as is found in a surgeon's instrument-case, I make a double vertical section, through the middle, from the top of the pileus to the base of the stipes, so as to remove a slice, (*t.* 83, *f. a. a.*) This, it will be at once seen, shows the vertical outline of the whole *Fungus*, the internal nature of its stipes, whether hollow, or spongy, or solid, the thickness of the pileus, and the peculiarities of the gills, whether equal or unequal in length, decurrent upon the stipes, or otherwise, &c. There will then remain the two sides or (nearly) halves of the *Fungus*, (*t.* 83, *f. b. b. b.*) which each in itself gives a correct idea, if I may so express myself, of the whole circumference of the plant. But before we proceed to dry *them*, it is necessary to separate the *stipes* from the *pileus*, and, from the latter, to scrape out the fleshy *lamellæ* or *gills*, if an *Agaric;* or the *tubes* of the *Boletus*. We have thus the *Fungus* divided into 5 portions; a central thin slice, 2 (nearly) halves of the stipes, and the same sections of the pileus:—these, after being a little exposed to the air, that they may part with some of their moisture, but not so long that they shrivel, are to be placed between dry blotting paper, and subjected to pressure as other plants; the papers being changed daily till the specimens are perfectly dry. When this is the case, the central portion, or slice, and the two halves of the stipes, are to be fastened upon white paper, together with the respective halves of the pileus upon the top of the latter, in their original position. Here will thus be three sections; from which a correct idea of the whole plant may be obtained. The *volva* and *annulus*, of such species as possess them, must be retained.

With care, even the most fugacious species, such as *Agaricus fimetarius*, *ovatus*, &c. may be very well preserved, according to this method.

Some of the smaller and less fleshy kinds will not require to have the *lamellæ* removed, such as *Agaricus filipes*, *supinus*, *galericulatus*, &c.

In collecting fleshy *Fungi*, care must be taken that they are not too old and absolutely in a state of decomposition, or

too much infested with the larvæ of insects. When this latter is the case, some oil of turpentine poured over them will either drive them rapidly from their holes, or destroy them. Species with a clammy viscid pileus it is better to expose to a dry air, or the heat of a fire, before being placed in the papers.

The separate parts of the Genera *Phallus* and *Clathrus* I fill with cotton: I keep them for a time exposed to a dry atmosphere, and then, after removing the cotton, subject them to pressure. The same may be done with the large tremelloid *Pezizæ*.

F. J. Klotzsch.

Tab. LXXXIII. *Fig.* A. represents a *Boletus* cut through according to the above method: *a. a.* the central portion or section: *b. b. b.* the two lateral portions or sections. B. an *Agaric*: *a. a.* the central section: *b. b. b.* the two lateral sections.

I have witnessed, with great satisfaction, the whole of the above process for drying the fleshy *Fungi*, and have now many species preserved in my Herbarium according to this method. Not only is the outline of the *Fungus* thus retained, and, in most instances, the essential distinguishing character; but there is this further advantage, that, from the specimens containing a smaller quantity of fleshy matter, they are infinitely less liable to the depredations of insects, than if the whole *Fungus* were submitted to pressure. In order to protect my Herbarium in general, as much as possible, from these troublesome visitors, I wash (with a camel-hair pencil) or sprinkle such specimens as are most subject to them, with oil of turpentine, in which I put a small quantity of finely pounded corrosive sublimate. It is true that this substance is not dissolved in the oil, but by shaking the bottle before using it, it is diffused throughout: and by the penetrating and subtle nature of the fluid, it is widely spread over the specimen so treated, and remains to protect the plant after the oil has

evaporated. Spirit of wine extracts the colour from the plant, and soils the paper on which the latter is fastened, as I have ascertained by experience.—*H.*

[TAB. LXXXIV. LXXXV.]

ON TWO ALLIED SPECIES OF THELEPHORA, FROM SOUTH AMERICA.

THE Exotic Fungi have seldom engaged the attention of Botanical collectors: comparatively few are found in our Herbaria, and those few are by no means well described, if they are described at all. I am perhaps myself chargeable with having given too short descriptions of the *Fungi* of M. de Humboldt's collection, published in Kunth's *Synopsis Plantarum Æquinoct.*, and subsequently in Humboldt's and Kunth's *Nova Genera Pl. Æq.;* in consequence of which, Professor Kunze, the well-known Mycologist of Leipzig, has applied the name of *Thelephora badia, mihi*, to a very different species, which he has communicated to my friend M. Klotzsch, and which now lies before me. I shall describe and figure the two: for although the former is represented by Mr. Kunth in the concluding volume of the *Nova Genera Pl. Æq.* there are but few persons who have the opportunity of consulting so rare and costly a work.

THELEPHORA. *Ehrh.*

Hymenium cum pileo homogeneum et concretum, papillis subrotundis obtusis sparsis obsitum vel omnino læve, undique ascigerum. *Asci* subimmersi, tenues, raro obsoleti. *Stipes* rarissimus. *Pileus* coriaceus, persistens, rarius regularis, contextu floccoso-fibroso. *Velum* nullum. *Fries.*

DIV. APUS.

1. Thelephora *badia;* pileo dimidiato sessili robusto coriaceo badio tomentoso marginato, zonis glabris nigris, pagina inferiori lævi carneo-glauco. *Klotzsch, MSS.* (TAB. LXXXIV.)

Thelephora badia. *Hook. in Kunth's Syn. v. 1. p. 12. Humb. et Kunth, Nov. Gen. Pl. Æq. v. 6. p. 73. t. 628.*

Hab. In ripa fluminis Magdalenæ, prope Mompox; regno Novo-Granatensi. *Humboldt.*

Pileus magnitudine variat, 3–5 uncias longus, ad 4 uncias latus, flabelliformis, lobatus, planiusculus vel etiam depressus, totus tomentoso-hirsutus, subfloccosus, etiam ad marginem hirsutus, intense badius, lineis depressis magis minusve profundis, distincte et pulcherrime zonatus, interdum nigris, glabris. *Substantia* crassiuscula, coriacea. Subtus omnino lævis atque glaber est hic fungus, colore hepatico-cinerascens.

I am not aware of any described species of *Thelephora* which at all approaches the present, except it be the *Thelephora Ostrea*, a native of Java, described and figured by Dr. Nees von Esenbeck in the 13th vol. of the *Acta Academiæ, p.* 13. *t.* 2., but that differs not only in the colour, but also in the texture, which is as thin as in the following species.

Fig. 1, Section of the Fungus, seen from beneath:—slightly *magnified.*

2. Thelephora *Kunzii;* pileo dimidiato sessili, coriaceo membranaceo tenui rigido fragili, fusco sericeo-velutino marginato zonis minutis concoloribus, 1½–2 unc. lato, 1½ unc. longo, subtus pruinoso ferrugineo. *Klotzsch, MSS.* (Tab. LXXXV.)

Thelephora badia. *Kunze in Weig. exs. Turin.* (non *Hook.*)

Hab. E Surinamo communicavit Prof. Kunze.

Parva et pulcherrima species, 2 uncias longa, 2–3 uncias lata. *Pileus* depressus, ferrugineus, nitidus, sub lente obscure floccosus, pilis arcte appressis fere adglutinatis, tenuiter zonatus. *Substantia* membranaceo-chartacea, undulata; subtus glaber, rufescens. Color ochraceus.

From the above description, it will be seen that this *Thelephora* differs from the preceding in size, colour, and espe-

cially in the texture of the upper surface of the *pileus*, which is glossy and velvety, rather than truly hairy, with obsolete closely placed zones.

Fig. 1, Portion of the upper-side, and *fig.* 2, Portion of the under-side:—slightly *magnified.*

[TAB. LXXXVI.]

SIMBLUM PERIPHRAGMOIDES.

CRYPT. FUNGI. Ord. ANGIOGASTRES. *Nees, Fries.* Subord. PHALLOIDEÆ. *Fr.*

GEN. CHAR.—SIMBLUM. *Klotzsch, MSS.* Volva sessilis, radiculosa, rotundata, receptaculum includens, in 2–3 partibus inæqualibus rumpens. *Receptaculum* amplum, subglobosum, cum stipite contiguum et concretum, liquorem mucosum continens, massa farinacea sporidifera intermixta. *Stipes* dein fistulosus, a volva distinctus, lacunosus, striatus, integer, in capitulum hemisphæricum e ramis cancellato-anastomosantibus, crispis, obliquis confluens.—Genus inter *Phallos, Lysuros,* et *Clathros* medium. Nomen ab σιμβλον, *favus.*

Simblum *periphragmoides. Klotzsch, MSS.* (TAB. LXXXVI.)

HAB. Apud terram, ad "Bois Chéry" Insulæ Mauritii. *Da. Telfair.*

Volva albida, vaginata, 3–4-fida. *Stipes* 3–4 uncias longus, 2 uncias latus, valde cellulosus, mucosus, fistulosus, striatus, flavescens, capitulo seu receptaculo terminatus. *Receptaculum* hemisphæricum fere globosum, cancellatum, areolis pentagonis ad margines pulcherrime crispatis. *Sporidia* pulposa, atro-virescentia. *Klotzsch.*

This remarkable plant was discovered at Bois Chéry in the Mauritius, and an excellent coloured drawing, made on the spot, together with specimens both dried and preserved in spirits, were obligingly sent to me by Mrs. Charles Telfair.

It was only seen in the advanced state in which it is here represented, when the *volva,* which sends down two or three rather stout fibrous radicles from its lower extremity, had burst at the upper into 3 unequal lobes; and the stipes and receptacle had attained to a height of 3–4 inches, both of a yellowish colour, and remarkably delicate cellular texture, hollow in the middle. The *receptacle* or *pileus* had so much the appearance of a honey-comb as to suggest the generic name. The cells were filled with gelatinous, dark-green sporidia: but in the spirits the sporidia were washed out, and the whole pileus was of a somewhat gelatinous texture, and cancellated, as represented at fig. 2, the edges of the bars regularly crisped. The plant yielded a powerful smell.

Tab. LXXXVI. Simblum periphragmoides. *Fig.* 1,1, Plants: —*natural size. Fig.* 2, Portion of the receptacle, (free from seeds):—*magnified.*

[TAB. LXXXVII.]

MYONIMA MULTIFLORA.

Tetrandria Monogynia. Nat. Ord. Rubiaceæ.

Gen. Char.—Myonima. *Comm. Cal.* tubus globosus, limbus minimus, obtuse 8- (4-) dentatus. *Cor.* tubo brevi, limbo obtuse 4-partito. *Stam.* 4, filamentis brevibus, antheris oblongis exsertis. *Stigmata* 4, linearia, brevia, crassiuscula, approximata (vix semper?) fere concreta. *Bacca* globosa non coronata, 4-pyrena, pyrenis monospermis, carni adhærentibus. *Semina* meniscoideo-umbilicata, medio affixa. *Albumen* carnosum. *Embryo* dorsalis, erectus, radicula infera teretiuscula, cotyled. cordatis obtusis. *DC.*

Myonima *multiflora;* foliis subsessilibus basi subcordatis ovato-oblongis acutis supra nitidis nervoso-reticulatis, subtus venosis, corymbis terminalibus. *DC.* (Tab. LXXXVII. A.) " *Rich. in Mem. Soc. H. N. Par. v.* 5. *p.* 132." *De Cand. Prodr. v.* 4. *p.* 463.—Myonima

grandiflora. *Bojer, MSS.*—Ixora parviflora. *Lam. Ill. t.* 66. *f.* 2. (figura mala.)—Ixora micrantha. *Roem. et Sch. Syst. Veget. v.* 3. *p.* 179.—Faramea corymbosa. *Sieb. Fl. Maurit. n.* 62, (non *Aubl.*)

HAB. In Insula Mauritii.

Frutex: Rami teretes, rugosi, cinereo-fusci; juniores læves. *Folia* opposita, breve petiolata oblonga, acutiuscula, superne sublatiora, inferne magis minusve cordata, integerrima, coriacea, supra intense viridia, subtus pallidiora. *Stipulæ* caducæ, et in meis examplaribus absunt. *Corymbus* terminalis, multiflorus. *Pedunculi* pedicellique purpurei, glabri. *Cal.* minutus, 4-dentatus. *Corolla* rotata, alba: *tubo* brevi, ad orem ciliato, limbo quadripartito; laciniis patentibus, oblongis, retusis, glabris. *Stamina* 4, ad basin laciniarum inserta et cum iis alterna: *Filamenta* brevia: *Antheræ* oblongæ. *Germen* inferum, globosum, glabrum, læve: *Stylus* exsertus: *Stigma* 4-fidum. *Bacca* tetrapyrena. *Semen* et *Embryo* ut in charactere generico.

Professor Bojer of the Mauritius, to whom I am indebted for a beautiful drawing, by Miss Baigrie, of this plant, could not have been aware that it was the *M. multiflora* of Richard, and of De Candolle, for it has been but very recently published by those authors under that name: nor could I have made myself certain of the synonym, were it not for Sieber's specimens, above quoted, in his "*Herbarium Mauritianum.*" There are, indeed, some points in which our figure does not quite accord with the description, such as the absence of reticulation on the upper side of the leaves, (which probably is much less apparent in the recent plant,) and the patent stigmas; but nothing more than what may be accounted for by our drawing being made from the living individual, while the descriptions were probably drawn up from dried ones.

TAB. LXXXVII. Myonima multiflora. *Fig.* 1, Flower. *Fig.* 2, Corolla, laid open. *Fig.* 3, Pistil and calyx. *Fig.* 4, Section of a berry. *Fig.* 5, Seed. *Fig.* 6, Embryo:—*magnified.*

[TAB. LXXXVIII.]

NORONHIA EMARGINATA.

DIANDRIA MONOGYNIA. Nat. Ord. OLEINEÆ.

GEN. CHAR.—NORONHIA. *Stadtman.* *Cal.* minimus, 4-fidus. *Cor.* globulosa, crassa, profunde 4-fida. *Stam: Antheræ* 2, in fundo corollæ et substantia reconditæ. *Ovarium* minimum, conicum, biloculare, 4-spermum. *Stylus* 0. *Drupa* oblonga (seu rotundata, *Bojer*): *Nucleus* bilocucularis; *testa* solida. *Semen* unicum, crassum, radicula supera: *Cotyledones* crassæ, absque perispermo, hypogeæ. —Arbuscula. *Folia* opposita, chartacea. *Flores* racemosi, axillares. Huc referendum *Oleam emarginatam* delineatam in Illustr. Generum D. Lamarck. Multis characteribus proprii sui generis, forma corollæ, situs staminum et præcipue indole seminis. *P. Th. Nov. Gen. Madag. p.* 8.

Noronhia emarginata. (TAB. LXXXVIII.) *Poir. in Nouv. Dict. des Sc. Nat.*—N. chartacea. *Stadtm. MSS.* (fide D. Prof. Bojer.)—N. Binia. "*P. Th. in Rœm. Coll. p.* 201." *Roem. et Sch. Syst. Veget. v.* 1. *p.* 72.—Olea emarginata. *Lam. Encycl. v.* 4. *p.* 545. *Illustr. t.* 8. *f.* 2. *Roem. et Sch. Syst. Veget. v.* 1. *p.* 70.

HAB. In Insula Madagascar, ubi Cl. Bojer legit, ad margines sylvarum, in ora orientali.—In Mauritii insula cult. "*Ponay des Indes*" Incolarum. *Fl.* Apr. (*D. Prof. Bojer.*)

Arbor 20–30 pedalis; trunco erecto, intus albo; extus cortice cinereo lævi crasso tecto. *Rami* alterni, patentes, cinerascentes; juniores colorati, glabri. *Folia* majuscula, obovato-oblonga, coriacea, crassa, glaberrima, integerrima, margine revoluta, apice emarginata. *Petioli* crassi, breves, lignosi. *Racemi* terminales et laterales, non raro oppositi, pedicellis oppositis basi bracteatis, bracteis lato-subulatis. *Cal.* 4-partitus, parvus, persistens. *Corolla* ochroleuca, globosa, carnosa, 4-fida. *Antheræ* 2, subsessiles, lato-ob-

longæ. *Germen* parvum, ovatum, glabrum: *Stylus* perbrevis; *Stigma* capitato-truncatum. *Drupa* nunc oblonga, nunc subglobosa, atro-viridis. *Nux* solida, ovata, acuta. *Semina* ovato-cuneata. *Bojer, MSS.*

Of this plant, likewise, I am indebted to the pencil of Miss Baigrie for the drawing, and to Professor Bojer for specimens and a description. The embryo, as here represented, seems to be very different from that of *Olea,* with which some botanists are disposed to unite this plant, but from which, in other respects, it appears very distinct.

It is a native of Madagascar alone, but is now cultivated in the Mauritius, where the pulp of the fruit is esculent.

Tab. LXXXVIII. Noronhia emarginata. *Fig.* 1, Calyx and pistil. *Fig.* 2, Corolla laid open. *Fig.* 3, Drupe. *Fig.* 4, Section of the pulp to show the nut. *Fig.* 5, Section of the nut, to show the seed. *Fig.* 6, Seed. *Fig.* 7, Embryo with the cotyledons spread open:—*magnified.*

[TAB. LXXXIX-XCV.]

ACCOUNT OF AN EXCURSION FROM LIMA TO PASCO,

WITH

Observations upon the Climate, particularly in reference to the Vegetation of the Country; in a Letter from Alexander Cruckshanks, Esq.; *to which is added, a List of some of the Plants found during that Excursion.*

Edinburgh, Nov. 25th, 1830.

To Dr. Hooker.

My Dear Sir,—In compliance with the wish you expressed when I had the pleasure of seeing you in Glasgow, I will proceed to give you a sketch of my trip from Lima

to Pasco, prefaced by some general observations on the climate of Chili and the western side of Peru. By bringing into one view a number of facts connected with the latter subject, some useful hints may be derived for the cultivation of plants from that part of the world; many species from thence being now common in our collections, and the number is constantly increasing, but their treatment is not always consistent with their natural habits. At the same time, as it is probable that the western side of South America will be more frequently visited by Europæan Botanists than formerly, it becomes a matter of some interest to know the best season of the year for exploring the different districts, especially where there is so much difficulty, at certain seasons, in travelling from one point to another. For want of previous information on this head, much valuable time has been lost by collectors arriving at different parts of the coast, when scarcely a plant was to be found in flower, and the weather would not allow of travelling in the interior. In the account of the road to Pasco, I will endeavour to give some idea of the sort of country that produced the few plants I was able to collect for you; but you are aware, that I was in very bad health during my stay in Peru, and my observations were necessarily very limited.

Chili, and that part of Peru lying west of the Andes, from their geographical situation and physical structure, offer an interesting field for studying the effect of climate on vegetation. The two countries present a line of coast, extending from 40° of South latitude, to within a few degrees of the Equator; the great chain of the Andes runs in a direction almost parallel to the coast, and the surface of the intermediate country is similar throughout, consisting of ranges of mountains, diminishing in height as they recede from the Cordillera. These mountains are intersected by vallies nearly at right angles to the great chain, and consequently varying little from due east and west, so that, while the coast is exposed to the action of those laws that regulate climate according to the difference of latitude at the level of the sea, the vallies afford an opportunity of tracing the

effects of difference of altitude in the same latitude, from the sea-shore, to the verge of perpetual snow.

The chain, or as it has been aptly called, the Great Wall of the Andes, exerts a powerful influence on the climate of the tract of country under consideration; the great atmospheric current, which, according to the season of the year, flows to the north or south, and, in other parts of the same continent, is affected by many local causes that give rise to variable winds, is here maintained in its original direction by the influence of this elevated barrier. During a great part of the year, a southerly wind prevails to the west of the Andes, and in summer it frequently blows with great violence on the coast of Chili; but it always brings a clear sky; it gradually moderates towards the north, and is only a light breeze when it reaches the coast of Peru. At the season when the sun approaches the Northern Tropic, the force of the south wind abates, and gales are experienced from the opposite point of the compass, accompanied by rain. The average duration of the rainy season is about five months, from the middle of May to the middle of October.

In the south of Chili the rains are very heavy, and fall at short intervals throughout the winter, which is there sometimes of six or seven months' duration. In the latitude of Valparaiso, it seldom rains more than two or three days in succession, after which, there may be fine weather for a week or two, often for a much longer period. At Coquimbo, three degrees farther north, the rain falls at still longer intervals; at Copiapo, the most northern part of Chili, the showers are few and light, and on the *coast* of Peru, rain is almost unknown; only a dense mist is experienced there during the winter months, but as the people know no other rain, this period is called there, as in Chili, the Rainy Season, (*tiempo de los aguacerros,*) and the ladies of Lima frequently complain, after a short walk, of the heavy shower they have been exposed to, in what we should consider, in this weeping climate of ours, tolerably fine weather. Even this mist diminishes as we proceed towards the Equator, so that, although the sun is seldom visible in Lima for

several months, it is not often obscured in the northern provinces.*

The gradual decrease of the atmospheric moisture from the south of Chili to the north of Peru, is one of the most singular features of the climate, and, as might be expected, its effects are shown in a manner not less remarkable in the appearance of the vegetation. In the southern provinces of Chili, those of Baldivia and Conception, and the Indian territory lying between them, where the country is watered by copious rains, forests of lofty trees abound, the earth is covered during a great part of the year with herbaceous plants, and large crops of corn are obtained without artificial irrigation. From Conception, most of the timber consumed in Chili and Peru is exported. The trees usually felled for this purpose, and which are common in the forests, are the *Roble,*† (*Fagus obliqua,*) *Lingui,* (*Laurus Lingui,*) *Queule,* (*Gomertiga nitida,*) *Laurel,* (*Laurelia aromatica,*) *Canelo,* (*Drymis chilensis,*) *Reuli,* (?) *Avellano,* (*Quadria heterophylla,*) and *Litri,* (*Rhus? caustica, Hook. & Arn. in Bot. of Beech. Voy.*)

The *Araucaria imbricata,* with the exception of one or two trees near the coast that have probably been planted, is only found in the interior of the Indian country, south of the Biobio.‡ Its wood is said to be very resinous and close-grained, but brittle. Whether it be from this circumstance, or the difficulty of transporting it from the interior, I am not aware, but the timber of the *Araucaria* is never exported.

Some of the trees above-named are peculiar to the south of Chili, but the *Roble* and *Laurel* are found as far north

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* This refers only to the *coast;* I shall afterwards have occasion to mention that heavy rains fall at certain seasons in the interior.

† *Roble* is the Spanish name of the Oak, and is applied to this tree, though belonging to a different genus, on account of the strength and durability of its timber.

‡ The Indians of that neighbourhood subsist entirely on the seed of the *Araucaria,* which they harvest and bury in pits for winter-use. The name of the tribe is derived from that of the tree which affords their food, the *Araucaria* being called *Pehuca* in the Indian language, and *ches* signifying people.

as the provinces of *Maule* and *Jan Fernando,* and the *Litri* and *Canelo* occur occasionally in other parts of the country.

In the middle provinces, the vegetation generally is much less luxuriant, and the country thinly wooded. Trees seldom attain a large size, except in hollows and ravines among the hills, and many of them are different from those of the south. Those most frequently found on the hills are the *Molle,* (*Schinus Molle* of Molina,)* *Boldo,* (*Boldoa fragrans,*) *Quillai,* (*Smegmadermos emarginata,*) and *Peumo,* (*Peumus rubra.*) The *Mayten,* (*Maytenus chilensis,*) *Lilen,* (*Azara serrata,*) *Litri,* and some others, are less common.

The *Patagua,* (*Tricuspidaria dependens,*) *Maqui,* (*Aristotelia Maqui,*) *Bellota,* (*Lucuma Valparadensis* of Mol.,) and *Canelo,* are confined to moist places in the ravines and vallies, where many *Myrtles* are likewise found, of which the *Temu* and the *Petra* grow to a large size, and produce useful timber. When covered with their fragrant white blossoms in the early part of summer, these two trees are truly beautiful. I may observe here that the *Fuchsiæ* too are only found in very moist ground, except the *F. lycioides,* which, in this respect, differs remarkably from the rest of the genus, and inhabits the driest situations in the hills.

In many places, where the soil is too poor or too dry for other trees, we find the *Espino,* (*Mimosa Cavenia* of Mol.) the wood of which is very heavy, and much valued for fuel. Near the Andes, the *Algaroba,* another tree of the same family, is common in similar situations. Large tracts on the hills where trees will not thrive, are frequently covered with *Pourrettia coarctata.*

In the district of which I am now speaking, of which Valparaiso may be considered the centre, though the surface has a very barren appearance in summer, pasture is everywhere abundant during the rainy season; and near the coast, corn is grown in favourable situations on the hills without irrigation. In the interior, however, the heat in summer

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* But, in fact, a very different plant, the true *Schinus Molle* being a native of Peru.

being greater, cultivation is confined to the vallies, where there is water to irrigate the land.

The northern provinces present a very barren aspect. From the river Chuapa to Coquimbo, there are few trees; though shrubs are still tolerably abundant, and many beautiful plants with annual stems are common in the rainy season; but there is no cultivation whatever, except in the vallies where the soil can be irrigated. The *Carbon* (your *Cordia decandra*) is almost the only tree that abounds; its wood is exceedingly hard and heavy, and in the absence of coal, well adapted for the purpose to which it is applied, the smelting of copper ore. Near the river Chuapa, there is another tree which affords fuel for the same purpose, called *Talguea;* but it is not the plant known by the same name in the south of Chili, (*Trevoa quinquenervia*,) which is described in your *Botanical Miscellany*, from Dr. Gillies' specimens. Various species of *Cacti*, which are only seen occasionally in the south, become exceedingly common in these provinces, and scarcely any other plants are found in the dreary country between Coquimbo and the valley of Guasco, and from thence to Copiapo. In the interior, the hills consist of immense masses of rock, frequently altogether destitute of soil; but they are covered with, I may almost say, forests of *Cacti*, for some of the columnar species, throwing out a great number of branches, grow to the height of thirty or forty feet, and are so abundant, that the withered stems supply fuel for refining all the copper smelted in the mining districts.

Beyond Copiapo, the country, retaining the same mountainous character, is a complete desert, which continues along the whole coast of Peru, to the mouth of the Guayaquil river, interrupted only by the vallies, which are from six to twenty or thirty leagues apart. Where the country is low, it is occupied by large tracts of sand whereon a few patches of *Tillandsiæ* are sometimes met with, the last genus of plants, perhaps, that a Botanist would expect to find where neither a tree nor shrub is to be seen. These, and a few stunted *Cacti* compose the Flora of the hills on the coast

during the greater part of the year. It is only for a short time in winter that an evanescent vegetation of annual and bulbous plants of considerable beauty appears whereever there is soil for them to root in. This, however, vanishes, as if by magic, in a very few days after the mist is dissipated, and the sun regains its power.

But though the aspect of the surrounding country is so cheerless and forbidding, it is impossible to imagine a more agreeable climate than that of the vallies of Peru. In summer, the thermometer stands at 74° or 76°, very seldom rising to 80°; and in winter it is not often down to 60°. The cool south breeze, though it blows less strongly than in Chili, becoming mixed with a warmer and more humid atmosphere, slightly diminishes its transparency, without producing any perceptible haze; the effect is only visible in the greyish tint of the still unclouded sky, but it is sufficient to moderate the power of the sun's rays. Those who have been in the East and West Indies, where the meridian heat is intolerable, are surprised at the comparative coolness of the coast of Peru, arising from this cause. Although Lima is only 12° from the Line, I felt no inconvenience from the heat at noon, when the sun was vertical.*

From the perpetual spring that reigns in these vallies, the vegetation is exceedingly luxuriant; almost every cultivated plant, from barley to rice and sugar-cane, comes to perfection; there is no rain nor violent wind to interrupt the labours of the field, and so favourable is the climate at all seasons, that the cane may be planted and cut every day in the year. On arriving at one of these vallies, the traveller is

* It must, however, be acknowledged, that this delightful climate is less healthy, especially to foreigners, than many others that are less agreeable. Although free from yellow-fever, cholera, and other fatal diseases common in Tropical climates, few people reside long on the coast of Peru without being attacked by intermittent fever, and having once suffered from it, they are liable to a continual recurrence of the complaint, which gradually undermines the constitution. A voyage to Chili, and a short residence there, is considered a specific for the cure of this disease, if resorted to before any organic mischief has been occasioned by it.

struck by the sudden transition from the sterility of the desert to the bright verdure of the irrigated land; the water channels are, of course, carried as close as possible to the hill, and at as high a level on each side of the valley as the fall of the river will allow, and while every inch of ground within these limits is covered with luxuriant vegetation, the parched hills on either side from the water's edge, are in a state of perfect barrenness.

From the small extent of land capable of cultivation, the vallies are for the most part cleared of wood; but a few spots are left for the growth of trees and shrubs for fuel. The trees most valued for this purpose near Lima, are *Willow*, *Manglillo*, (*Manglilla Jussieui*, Pers., *Myrsine Manglilla*, Br.) and *Huarango*, a species of *Acacia*, which resembles, in habit and the hardness of its wood, the *Espino* (*Acacia Cavenia*) of Chili. Among the shrubs in the same neighbourhood are various species of *Cordia*, *Buddlea*, *Heliotropium*, *Lantana*, *Lycium*, and *Jussieua*. The wood, however, is strictly confined to the vallies, the hills being entirely destitute of the forests that clothe the country to the east of the Andes. There is, indeed, a most remarkable difference in the features of the eastern and western parts of Peru. Towards the coast, the climate is temperate, the rivers small and distant from each other, and the hills bare of wood: wild animals are very rare: there are few birds, and noxious reptiles are unknown. The country, its climate, and productions, appear to belong to a dry part of the Temperate Zone. We have only to cross the Cordillera, and descend towards the east, to find the country covered with lofty trees, from a great elevation down to the plains, and along the course of the numerous large rivers that fall into the Maranon; the forests are filled with wild animals and venomous snakes; numberless birds of splendid plumage inhabit the trees; while alligators and tortoises abound in the rivers. We have here, in short, all the productions of a moist tropical climate; and yet the two countries, or rather districts, are in the same latitude, and separated only by the mountains of the Cordillera.

Throughout the whole of Chili, the dry and rainy seasons

occur at the same time on the coast and in the interior, and snow falls in the Cordillera when it rains in the low country; but the case is very different in Peru, where rain falls inland and snow on the Cordillera during those months when the sky is clear towards the coast. These rains begin in November, and last till March or April; while the misty season, in the maritime district, is from May till October. Hence, summer and winter, in warm climates, being synonymous with dry and rainy season, we have winter in the interior when it is summer on the coast, and *vice-versâ.* One frequently hears this on arriving in the country, but the anomalous fact at first sounds strangely to those who have been accustomed to use the terms winter and summer with relation to the sun's position, north or south of the Equator.

This singular contrast of the seasons may be witnessed almost every day in the middle of the Lima summer, from the bridge of that city, which commands an extensive view up the Valley of the Rimac: the dark rain-clouds are seen rolling among the mountains, where the tempest is raging in the interior, and sometimes a faint echo of distant thunder reaches the ear; the swollen river, coloured red with earth washed from the hills, runs foaming beneath the feet of the spectator, and he is all the while standing under a bright and cloudless sky, on a spot where a storm was never known in the memory of man.

As an account of the road between Lima and Pasco will serve to illustrate these remarks, it will be better now to give a sketch of my journey thither, and afterwards conclude what I have to say on this subject.

A few years ago, the name of Pasco was hardly known in England, although its mines are among the richest in South America; but since the opening of the trade to Peru, and the formation of companies for draining and working the mines, it has become a place of great interest to our merchants, the greater part of the silver coined in Lima, and exported in exchange for foreign goods, being produced there.

The mines of Pasco are situated about 45 leagues N. E. of Lima, at the eastern extremity of a large plain, which,

between $10\frac{1}{2}°$ and $11\frac{1}{2}°$ of south latitude, occupies the centre of the Cordilleras of the Andes, whose more elevated peaks form a vast amphitheatre around it. There are several roads to this plain up the different vallies that run eastward from the coast, but the nearest, and that most frequented in going to Pasco, is by the first valley north of Lima, through which the river of Chillon runs: it is usually called the Canta road, from a town of that name in the upper part of the valley.

Having determined to accompany my friend Mr. M——, an English merchant of Lima, who had been appointed Director of a Company for draining the mines, we left the capital at noon on the 21st of June. Our party consisted of six individuals, and we had with us three English workmen belonging to the Company, a servant, and three muleteers: eight laden mules completed the cavalcade.

On leaving Lima, the road proceeds for about a league towards the coast, to a place called Arnipuquio, and then, rounding the hills that separate the two vallies, enters that of Chillon and turns inland. The *Scotch-misty* weather, the winter of the coast, had lately set in, and the hills were beginning to show the effects of the moisture, being thinly clad with verdure wherever a covering of soil had accumulated on the rock, and in many places we saw large patches of the bright golden *Amancae*, (*Narcissus Amancaes*, Ruiz and Pav. *Pancratium Amancaes*, Ker,) which is, I believe, peculiar to this neighbourhood. About half a league out of Lima in this direction, there is a little valley bounded by very high hills, called *Los Amancaes*, from the vast number of these flowers that appear there at the beginning of winter. The great height of the hills encourages a plentiful deposition of moisture, which produces a more abundant vegetation than is usually seen on the coast. After the rains have ceased in the interior, the Indians who rear cattle there are accustomed to drive them down to different parts of the hills and vallies in the low country, till they reach the coast; and at this season, a considerable number of small flocks and herds are brought to feed at *Los Amancaes*. During their stay,

the place presents the appearance of a fair, from the number of people who go out to *pic-nic*, and spend the day in roaming among the hills and decking themselves with the flowers, or in dancing, horse-racing, and other sports. This annual *promenade* commences on St. John's day, the *Amancaes* being then in full flower; and from an early hour, a great part of the motley population of Lima are seen swarming towards the hills, gaily dressed in all sorts of colours, of brighter hue, but not more varied in their tints than the complexions of the wearers. When the day is fine and the mist confined to the hills, the scene is singularly picturesque. On one hand, the steep rocky sides of the valley are studded with cattle tended by their Indian owners, and gradually disappearing in the mist as they wind among the hills, the plain below, extending to the main valley of the Rimac, is covered with groupes engaged in various sports, and fresh parties constantly arriving; while, on the opposite side of the river, with distant mountains for a back-ground, the white spires of the city are seen through the groves of orange-trees in the gardens of the suburbs; and lower down, the cultivated valley leads the eye to the ocean, with the Island of San Lorenzo rising abruptly in the distance.

The season was considered late, and the cloudy weather had not extended far inland, so that, after proceeding a few leagues, the hills were perfectly naked, and exhibited a marked contrast to the fields of maize and lucerne in the valley below. We arrived before sunset at an estate called Punchanea, five leagues from Lima. The proprietor, an old Spaniard, to whom one of my companions had rendered some essential services during the revolution, gave us a hearty welcome, and an excellent supper was prepared for us, without garlic. As a compliment to our English tastes, too, the supper was no sooner removed than *tea* was placed on the table.

Providing beds, especially to a party, forms no part of the hospitality shown to travellers in South America. Each person, if he have a luggage mule, carries bedding with him, but at all events, he has some rugs and a blanket over his

saddle, which, with his *poncho*, answer the purpose exceedingly well after sitting all day on a mule. We were, therefore, of course, provided with *furniture* for an immense empty apartment, into which we were conducted, and which was to serve us for a dormitory. In Chili, most people on a journey prefer sleeping in the open air. Those who have never tasted the luxury of passing the night beneath the bright starry sky of a climate like that of Chili, cannot form an idea of the sound and refreshing sleep the traveller enjoys there, nor of the elasticity of spirits, and perfect freedom from fatigue, with which he springs from his grassy couch, when the muleteer warns him that the day is beginning to dawn, and the mules await him to pursue his journey. But in Peru, especially in the vallies near the coast, where the climate is "fair and false," it is usual to sleep under cover: the traveller, who, unaccustomed to the climate, should venture to pass the night in the open air, would most likely awake with an ague, and very frequently, his only alternative is to immure himself for the night amidst the smoke and filth of an Indian hut.

June 22d.—We could not start till eight o'clock, having to wait for a fat sheep our host had ordered to be killed for us. The carcase being duly packed in its own skin, and placed between two trunks on a mule, we set out, accompanied by our hospitable friend, who rode with us to the boundary of his estate, where he left us to pursue our journey. The road continued to wind round the foot of the hills on the south side of the valley, to the estate of Cavallero, where there is a post-house, generally made the first stage from Lima, from which it is distant six leagues. Near this place there is a bend in the valley, and in order to avoid the detour, it is usual to proceed up a ravine among the hills, from whence the road falls again into the valley, several leagues farther up. The ravine is called *Rio Seco*, (*dry river*,) and dry enough it certainly is, for not a drop of moisture is seen for a distance of five leagues, although there are unquestionable marks of its having been, at some former period, the bed of a considerable stream. This *Rio Seco* presents a

very fair specimen of Peruvian barrenness, of which it is hardly possible to form an idea without witnessing it. I have already alluded to the desert appearance of the coast, where you may travel whole days, over pure sand, without any trace of vegetation; or, if the road lies occasionally near a range of mountains, the scene is only varied by masses of bare rock, of which the fragments that cover the road are as fresh and unsoiled as if they had fallen but yesterday from the hammer of a mason. Of the latter description is *Rio Seco*, except in a few spots, where nature, as if to vindicate her power even in a desert, has scattered some patches of *Tillandsiæ*, and these exiles from the vegetable world flourish in spite of the arid atmosphere and burning sun. One species, the *T. purpurea*, was in full flower when we passed.

As the day advanced, we found the heat excessive, having now exchanged the hazy atmosphere of the coast for the clear deep blue sky of a tropical mountain region. At the head of the *Rio Seco*, the road winds up a steep hill, from the summit of which, the green valley is seen at a distance of two leagues, tantalizing the thirsty traveller during the two hours that his mule takes to crawl over the rough stony bottom of the ravine that leads to it. The *Tillandsiæ* are here replaced by a few *Melocacti*, and one or two solitary plants of *Cactus tetragonus*.

We regained the main valley about three o'clock, at a place called Yangas, consisting only of half a dozen houses, immediately beyond which is the village of Alcocota, five leagues from Cavallero, by the road we came; by the valley it is six leagues and a half. The valley, where we turned off, is nearly a league in breadth, but here it had contracted to about a mile, and the hills that bound it are high and steep, especially on the north side, where the rock forms a perpendicular wall. Greenstone is the prevailing rock all the way from Lima to this place; between the city and Arnipuquio, it is partially covered with stratified limestone and slate-clay, and in the ravine leading to Alcocota, by coarse argillaceous limestone.

Alcocota is considered the boundary of the rainy district,

but the showers are only experienced occasionally; a few leagues higher up, they fall constantly during the mountain winter. No vegetation yet appeared on the hills, except *Cacti*, chiefly *C. tetragonus*, which became more common as we proceeded. There were *Huarango trees* and *Willows* in the valley, rows of the latter being frequently planted along the water-courses. I had not hitherto had an opportunity of collecting a single plant, though, doubtless, many might be found in the low ground; but, in order not to encroach on the cultivable land, the roads are generally carried along the sides of the hills where that is practicable, although the route becomes more circuitous, and more fatiguing for the mules. A little higher up, the *Molle* (*Schinus molle*) began to make its appearance, loaded with its bright red berries.

At the end of two leagues, we came to Santa Rosa de Quive, a small place consisting now only of a few huts on the hill-side; a church and some houses in the valley having been destroyed by fire during the revolution. Here we halted for the night. The little hut where we stopped, was not large enough to contain one-third of our party; but being on an eminence far above the valley, there was no danger in sleeping out of doors, and we therefore took up our quarters in an open shed.

June 23d.—Having been fortunate in escaping the attacks of mosquitoes, which are numerous in the valley, we rose at daybreak, and started as soon as our numerous beasts could be laden and saddled.

The rock here is granite, which is again succeeded by greenstone. After leaving Santa Rosa, we observed little difference in the appearance of the hills, which were still covered with *Cacti* till we approached Yazo, a small village three leagues farther up. Though seated on a natural platform, far above the valley, the inhabitants of Yazo are very subject to intermittent fever, and the place has a bad name, on that account, among those who travel to Pasco; but there can be no doubt that the people bring the germ of the disease from below. They work all day in small pieces of irrigated land in the narrow valley, where the heat is

increased by the reverberation of the sun's rays from the steep rocky mountains, which, at the same time, prevent a free circulation of air; and, from the clearness of the sky, they are exposed after sunset to a sudden chill, while surrounded by a moist stagnant atmosphere in this confined situation. I was obliged to put up here on my return, and, although I had just recovered from a severe attack of the fever, I found no bad effects from sleeping in an open shed.

The hills near Yazo are very steep, and the road occasionally very narrow, especially in one part, where it forms a mere ledge on the side of a nearly perpendicular hill. A pass of this sort is called a *ladera*. The bank above, consisting of large rolled stones imbedded in gravel, bore evidence of the heavy rains in winter, being ploughed into numerous channels, and at that season it must be dangerous to pass. From some of the loose earth giving way during the earthquake in 1828, a man and several mules were precipitated into the valley and killed.

On approaching Yazo, some plants appeared by the roadside, and they became more abundant as we advanced, only a few, however, remained in flower. Two days ago we left the new grass springing up on the coast; here the plants were shedding their ripened seed. In this neighbourhood, I found the white-flowered *Loasa*, *Hoffmanseggia falcaria*, and *Convolvulus secundus*, and in the valley where the road descends for a short distance, *Malesherbia thyrsiflora* and *Lobelia biserrata*, Cav. In the next two leagues, to Huarimayo, the hills are partially covered with dry grass and other small plants, with occasionally a few shrubs. Several species of *Browallia* were in flower, the *B. viscosa* very common. In the valley, I found the red-flowered *Salvia* and *Mentzelia aspera*, and the rocks were covered with *Tillandsiæ*.

At Huarimayo, there was only a single hut, where travellers usually halt their mules, previous to passing a long and elevated *ladera*, called the Pacron. This is on the north side of the stream which we had crossed, lower down, on a very frail bridge, made of branches of trees laid from bank to bank. The roof of the hut is a botanical curiosity; the whole surface

of the thatch being covered with a dense mass of *Tillandsiæ*, of which the seeds have probably been carried there by the wind. When in flower, this unique garden must have a picturesque effect. A large *Molle* was growing in front of the hut, and it had been wounded by chipping the bark in several places to procure its *resin*, which is much valued as a remedy for bruises; it was exuding plentifully in whitish tears.

On leaving Huarimayo, we continued along the north side of the valley, which is only wide enough to afford a passage to the stream. The hills rise so abruptly, that, in cutting a road, it has been necessary to carry it to a great elevation, following a natural break in the declivity of the mountain, which allowed a breadth of a few feet to be levelled between a precipice on the one hand, and the almost perpendicular wall of rock that rises on the other. The rushing noise of the stream gradually became more faint as we ascended, and died away before we reached the greatest elevation, at nearly 400 feet above its bed. The profound silence that reigns in solitary mountain-districts, where there are no trees, and we hear neither the song of birds nor the humming of insects, was only broken at intervals by the shouts of the muleteers encouraging or threatening their troop, as they wound slowly in an extended line along the sinuosities of the mountain. Sometimes, a mule, pressed by a heavy load, showed a disposition to halt and rest, and consequently stop all those in his rear, in places where it was almost impossible to reach him; but in such cases, a mixed volley of stones and imprecations, with threats of future punishment, which experience had taught the offender not to despise, soon had the effect of putting him again *en route*.

It chanced that several troops of laden mules, bound to Pasco, were passing the *ladera* at the same time, and followed in our rear. Our muleteers had neglected the usual precaution of sending forward a messenger to prevent others from ascending in the opposite direction till we should have descended to the valley and left the road clear; the consequence was, that we were met at the end of the *ladera* by another party that had just ascended, and our muleteers being in fault, the

others insisted that we should return; which, however, was out of the question, as there were a great number of mules behind, in situations where it was impossible for them to turn round. After much time spent in altercation, it was agreed, that as our opponents had more room to move about in, they should endeavour to drive their mules up the hill above the road, which was there rather less steep; this, with the assistance of our muleteers, was at length accomplished; and while we passed down they remained perched in situations that hardly promised footing for as many goats. There is, perhaps, more risk in the descent than in the *ladera* itself, the road making several sudden turns on the face of the hill, where it is cut into steps to prevent the mules from slipping.

In this part of the valley, on the south side, a hill rises abruptly to an elevation of nearly a thousand feet, and from its summit a slender stream, like a band of silver, fringed with verdure, winds its way down the steep declivity. At the highest point, though not seen from the same spot, is a small Indian village, very difficult of access, whose inhabitants are called in the *Quichua* language by the now classic name of "The Children of the Mist."

The aspect of the scenery was here totally changed. The *Cacti*, which abounded on the granite and greenstone rocks to some distance above Yazo, had disappeared with the rocks themselves, and were succeeded by a more kindly vegetation. *Trap tufa*, or conglomerate, was here the prevailing rock. *Porphyry* appeared in a few places, and rolled masses of it are imbedded in the *tufa*. The hills, though steep, were much less rugged than before, and mostly covered with shrubs and herbaceous plants, but the greater part of them were past flowering. Near Huarimayo are many *Pourrettiæ* and *Aloes*, especially *A. perfoliata*. In the valley, after passing the Pacron, *Tecoma sambucifolia* and *Mutisia viciæfolia* were common; and, as we proceeded, the bank was studded with the scarlet flowers of the latter. The *Tecoma*, a very handsome shrub, is called by the Indians *Huarumo*, and its wood, which is very tough, is much valued for the shafts of lances. Higher up, I found the *Monnima* in

moist ground, where there were likewise several plants of *Psoralea glandulosa,* the *Culen* of Chili. The *Molle* frequently occurred on the banks of the stream, which were covered with large shrubs.

The valley, which had narrowed into a mere ravine, opens a little on approaching the town of Obrajillo, three leagues from Huarimayo, which we reached about sunset, after recrossing the stream, over a natural bridge formed of two masses of rock that incline from the sides, and, meeting over the middle of the channel, leave a passage for the water beneath.

Obrajillo is twenty-one leagues from Lima, about mid-way between that city and Pasco. Most of the muleteers who pass between the mines and the capital reside there; a great convenience to travellers, as they get fresh mules for the remaining half of the journey. The valley is wide enough to allow some ground to be cultivated between the town and the stream; and above the town, towards the south, there is a recess in the mountains, occupied by low rounded hills, which have been levelled and formed into a series of small terraces for the cultivation of grain and vegetables, a sort of work for which the ancient Peruvians were celebrated. These patches of land being irrigated by a stream of water brought from above, the tufaceous rock readily decomposes by the constant moisture, and, combined with vegetable mould washed down by the rains, forms a black fertile loam, which yields luxuriant crops without manure. On an eminence at the extremity of this cultivated land, about — feet above the level of Obrajillo, and half a mile distant, in a straight line, stands the town of Canta, the chief town of the province of the same name, and the residence of the Intendent and a Governor; it consists, however, like Obrajillo, of small houses, little better than huts, and the population of the two towns, chiefly Indian, is only about eight hundred souls.

The day after our arrival was the feast of St. John, the patron saint of Obrajillo. Our muleteer being one of the alcaldes of the town, and named after the saint, his presence was considered necessary at the festival. It was recollected,

too, that the name of my friend was likewise John, and as the people of the town are chiefly supported by the traffic occasioned by the mines, which was expected to be greatly increased by the erection of the steam engines for draining them, it was argued, that there could be no hope of patronage from the saint in the undertaking if we refused to devote a day to him. A still more powerful argument was mentioned incidentally, that as the fresh mules were feeding at some distance, they might not arrive sufficiently early for us to start the following day, even if we wished it, which meant, as we knew by experience, that the mules certainly *would not* arrive, whatever our wishes might be, and we were therefore obliged to declare our willingness to do honour to the saint. For my part, I was very well pleased to stay, as the delay gave me time to pack up my seeds, and change the papers of my plants, and to collect a few more in the neighbourhood.

I had not yet seen any *Calceolariæ* on our route, but here several species were common. The fragrant *Verbena peruviana* abounds in the hedges along the path to Canta. The *Perilomia ocymoides* I only saw in the immediate vicinity of the town.

The celebrated *Yellow Potatoe* of Peru, (*Papas amarillas*,) is grown here, and indeed its cultivation is almost confined to a few spots in the interior, at the same distance from the coast, and probably about the same elevation. The best are said to come from Huamantanga, a small town in a neighbouring valley, and they are known in the market of Lima by the name of *Papas de Huamantanga.* This vegetable, which has been cultivated at the Garden of the Horticultural Society,* and other places in Britain, and proved to be a variety of *Solanum tuberosum,* differs from all the other

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* *Trans. Hort. Soc. v.* 6. *p.* 6. Though not deserving of the extravagant character that has been given of it, the *Yellow Potatoe* is considered by those who have eaten it in Peru, far superior to any that we have in cultivation. It is, however, there, as in this country, a very indifferent bearer. Perhaps some useful variety might be obtained from its seed, by fertilizing the flower with the pollen of a more prolific plant.

known varieties of that species, in its partiality for a particular climate. It does not succeed in the vallies near the coast, where no difficulty is experienced with the common sorts, and I tried in vain to raise it near Valparaiso, although it is said to be abundant at Baldivea, in the south of Chili, where the climate is not unlike that of the higher parts of Peru. My plants grew luxuriantly, and flowered, but they produced no tubers. I did not see any in cultivation in Peru, nor could I learn that the mode of culture was different from that of the common potatoe. I merely understood that care is taken to earth up the plants repeatedly; or, when the stems are about a foot high, they are laid horizontally and earthed over, perhaps in order to encourage the formation of tubers from the buds. The people, however, said, that it was not to any particular treatment that they attributed the successful cultivation of the plant, but entirely to the climate of the hilly country, (*temperamento de la sierra.*)—See Appendix A.

On the 24th, St. John's day, a great part of the population of Canta and Obrajillo assembled at the church of the latter to hear mass. The walls of the building were decorated with large bouquets and festoons of flowers, and the interior was lighted up by a great number of candles, mostly furnished by the poor Indians, who are taught to consider such contributions as part of their religious duties. Among other ornaments, we were struck by a unique display of small flags, formed of coloured cotton handkerchiefs of different patterns, from the looms of Manchester and Glasgow, fastened to canes that were stuck into the walls. There was not room within the church for all those assembled, and many knelt in the open air before the door, where they remained till the mass was said; and during the whole time, six Indian girls were dancing, and singing in the Quichua language, in the midst of them. When the unfortunate aborigines of these countries were first subjugated by the Spaniards, in order to insure their attendance at the festivals of the Catholic Church, the priests allowed them to use the songs and dances they had been accustomed to at their own feasts,

and the custom is continued to the present day. After mass, the congregation, headed by the priests, marched in procession round the plaza, and while the latter were chaunting a part of the church service, the Indian girls continued to dance and sing round them, accompanied by several men dressed in the ancient costume of the Incas, some of them having their faces covered with hideous masks made from calabashes. This performance was continued even while the priests were officiating at a temporary altar, erected on one side of the plaza. Immediately after the procession, a cock-fight was exhibited, and the rest of the day was consumed in eating and drinking.

As no one could be prevailed upon to go in search of our mules during these important proceedings, it was long past noon on the 25th ere we were able to pursue our journey, and we determined only to proceed as far as Culluay, three leagues higher up, and the last inhabited place in the valley. The next stage, of seven leagues, lies across the Cordillera, and there is no intermediate place to sleep at.

I had first seen the *Perilomia* at the entrance of Obrajillo, and just above the town it was very abundant for a few hundred yards, after which I saw no more of it; neither did I observe the *Molle*, nor the *Huarumo*, above Obrajillo; but the *Mutisia* continued to spread itself in every direction over the shrubs, which were loaded with its blossoms. After skirting the hills for some distance, the road descended to the valley, along which it then continued. As we ascended, we perceived every moment that we were entering a colder climate, where the season was less advanced. Green grass appeared among the numerous shrubs, and many plants were only coming into flower; among these were *Loasa contorta*, *Calceolaria bicolor*, and other species of that genus. The most common plant was the large shrubby *Lupine*,* which flowered lately in the Botanic Garden of Glasgow.

A little below Culluay, the valley expands, and a consider-

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* *Lupinus Cruckshanksii*, nob. in Bot. Mag. t. 3056.—*Ed.*

able extent of level land is cultivated by the inhabitants, who were harvesting two sorts of roots, the *Oca*, (*Oxalis tuberosa*,) and *Olluca*, (*Tropæolum tuberosum*,) of which the Indians are very fond, and which thrive at a great elevation in the mountains, where scarcely any other vegetable can be cultivated. The alcalde, at whose dwelling, being the largest in the place, we intended to pass the night, was absent, like the rest, in the fields; and the door being locked, we had to wait patiently for his return.

It was evening when we arrived, and, as the sun went down, we found the air piercingly cold, so that we were glad to crowd round the turf fire of a smoky hovel, that served for a kitchen, till our host came, and supper was prepared. A party from Pasco arrived shortly after us, and informed us that snow had fallen for several days in some parts of the Cordillera, where partial snow-storms are occasionally experienced at all seasons, but it seldom falls till after mid-day.

On the neighbourhood of Culluay, as well below as above the town, the rocks are granite and porphyry; many detached blocks of *calcareous tufa* are spread about near the town. For the last mile or two, the rocks by the roadside were quite covered with the *Loasa*, and various *Calceolariæ*, and a species of *Asplenium* filled many of the crevices.

27th.—As we had a rough day's journey before us, we were obliged to rise before daylight, and several of our party who had not quitted Lima for some years, did not at all relish the fresh morning air, at a temperature very little above freezing.

Advancing from Culluay, there is a great sameness in the appearance of the hills, which are mostly covered with a smooth compact turf. A long *ladera* conducted us to the head of the valley, where we crossed a small rill that takes its rise in a neighbouring ravine, and is the source of the river of which we had traced the course from the coast. At this spot, called the Alto de Jacaybamba, two leagues from Culluay, we commenced the ascent of the Cordillera. It was steep and rugged, lying among rocks of porphyry and *tufa*, like that at Canta. A large insulated hill, called La Viuda,

several hundred feet above the road at the highest part of the pass to which it gives its name, consists of the latter rock, enclosing large rolled masses of porphyry. On the hills that we passed in the morning, although at a less elevation, there were no shrubs, the cold wind that sweeps unobstructed over the smooth sward, being inimical to the growth of young plants, which, on the contrary, find shelter among the masses of rock on the ascent to La Viuda, where stunted shrubs are very common.

The pass of La Viuda is said to be 15,000 feet above the level of the sea.* On gaining the summit, a league from the bottom of the mountain, we came upon a more open country than we had seen since the commencement of our journey, though the prospect was still somewhat limited, the lowest situation being, of course, chosen for the road, from which we only had a partial view of the higher mountains in the distance, covered with perpetual snow. We descended very gradually among low ranges of black limestone, with impressions of shells; a very extensive formation in this part of the Andes. The skirts of the hills, and the little vallies and tracts of level ground between them, were covered with verdure, and the deeper hollows were occupied by lakes, the water of which was of a dark blue colour, more intense than that of the waters of the ocean; in some of them, the deeper tint was varied by patches of bright turquoise, from the bottom being of a whitish colour, and the water less deep.

We had long passed the region of trees, and even shrubs had disappeared. The most conspicuous plant was a low, spreading *Cactus*, in large patches among the rocks; being covered with abortive spines like white hairs: it had, at a distance, exactly the appearance of wool. Near La Viuda, I observed *Culcitium rufescens*, and a species of *Trevoa;* a

* I am sorry to find that I have mislaid a memorandum of the altitudes of the principal places between Lima and Pasco; they were measured barometrically by Don Mariano Rivero, and published in Lima, in the *Mémorial de las Ciencias Naturales*, of which he was one of the conductors. As the list includes several of the places where Ruiz and Pavon collected, I hope I shall be able to procure a copy of it for an early number of the Botanical Miscellany.

few *Gentianæ*, especially *G. sedifolia*, presented themselves occasionally as we proceeded.

The snow that had lately fallen had already disappeared from the open ground, but much of it still remained in sheltered places.

Before leaving Culluay in the morning, we had been advised not to take any breakfast except a little broth, to lessen the risk of suffering from the *puna* or *veta*, the sickness that frequently attacks those who are unaccustomed to breathe the rarified atmosphere of these elevated regions. None of the party, however, had experienced any inconvenience in the ascent; and after proceeding about half a league, where the elevation was considerably less than at the pass, we halted at one of the lakes, and breakfasted on some cold meat. But we soon found that we had calculated rather hastily on our exemption from the *puna;* and that, like sea-sickness, which it resembles so much in other respects, it does not always immediately attack those who are liable to be affected by it. Before we had advanced half a mile from the lake, several of the party began to suffer from headache; and Mr. M—— and myself were so ill that we found some difficulty in reaching the end of the stage, a place called Casa-cancha, to which we descended about four o'clock. We had scarcely arrived when we were both ceased with violent vomiting, accompanied by all the sensations that usually attend sea-sickness, but the throbbing pain of the head was much more acute and depressing.

It is generally said that difficulty of breathing is one of the most common and distressing symptoms of this disorder, but it is not the case. Few people suffer in their respiration, although the pulse is frequently accelerated, while they are riding or walking on a level road; it is only in walking over rough ground, or in climbing the mountains, that respiration is affected, and it then becomes necessary to halt repeatedly and take breath. The miners work as hard, and perform the same quantum of labour at Pasco, fourteen thousand feet above the level of the sea, as those at a sixth-part of the elevation; and indeed the English mechanics there, unless very

laboriously employed, performed their work without suffering any inconvenience from this cause. Several of our party, who had frequently been at Pasco, and resided there a considerable time, were not affected; and, indeed, the only one who was attacked besides Mr. M—— and myself, recovered almost immediately. In this, too, the *puna* resembles sea-sickness, that different individuals, under precisely similar circumstances, are affected in a very different degree, and many do not suffer at all. It is, however, worthy of remark, that the same persons are not equally affected by the two disorders. My friend and I, some years before, had made a voyage of four months together, and he only suffered for a few hours from sea-sickness, while I was never wholly free from it during the voyage; but, in the present instance, he suffered more severely than I did. Persons of full habit, affected with the *puna*, frequently spit blood. Some months before we passed, an Englishman, who had been employed at the mines, set out to walk to the coast; he had previously been in bad health, and shortly after his arrival at Casa-cancha he died, from hæmorrhage, having burst a blood-vessel in the lungs.

The valley of Casa-cancha is about half a mile wide, abruptly terminated by the limestone hills we had passed over, and bounded at the side by red sandstone and conglomerate. We were lodged at a miserable hut, built of stones and mud. The single apartment, of which it consisted, served us successively for a kitchen, dining-room, and bedroom; the dinner was cooked over a turf fire, the smoke from which eddied round the roof, and then partially escaped by the door-way, which was only about four feet high.

At daybreak, on the 28th, when we raised the piece of sooty cloth that served for a door to our dwelling, the whole valley was so thickly covered with hoar-frost, that it appeared as if snow had fallen in the night. We were delayed more than two hours from some of our mules having strayed to the hills. As the beasts are suffered to wander about at night in search of pasture, an Indian is generally to be found where travellers halt, who, for a trifling reward, undertakes to keep them together: he passes the night in the open air, frequently

in the midst of frost and snow, and is seldom known to sleep, or neglect his charge. In this instance, a dense mist had filled the valley, and no blame could attach to the watchman; but from the abuse that was lavished upon him, one would have thought that he had been taken in the act of stealing all our mules, instead of merely not having seen one or two of them through the mist on a dark night.

Mr. M—— continued very ill, and although I felt tolerably well when I rose, we had not travelled half a league when the headache returned with increased violence, and it was greatly aggravated by the motion of the mule. Some of our companions, too, were similarly affected in the course of this day's ride.

The valley, and even the slopes of the hills, were so swampy, that we travelled very slowly for about a league and a half, when we left the valley, and crossed over some high land that brought us to the small river of Palcamayo, three leagues from Casa-cancha. Red sandstone, breccia, and conglomerate prevail as far as Palcamayo, where I observed whitish stratified limestone, and *Calc-tuff*, with blocks of *Lydian-stone*, that appeared to have fallen from the hills above; afterwards, the sandstone and conglomerate, containing large *quartzose* pebbles, were the only rocks that occurred near the road. From Palcamayo, we passed over a succession of low hills, covered with short grass; the intervening hollows were very swampy, and we were frequently obliged to make a long circuit to avoid them. In such places, there was sometimes a considerable depth of peat, an occasional rupture exposing a thickness of several feet of the decayed roots of the grass, which, mixed with mosses and *Lycopodiaceæ*, continues to grow on the surface of the spongy mass. The whole of the district through which we were travelling, including the plain of Bourbon, whither we were bound, and the country for many leagues to the north and south, may be considered as forming an immense basin between two distant Cordilleras; and from the quantity of rain and snow that falls in winter, and the thawing of the latter on the summits of the hills and sides of the mountains during

summer, the subsoil in the low grounds is always saturated with moisture, and numerous springs issue from the surface. On the plains and slopes of the hills, there is, all the year, an abundance of grass, which serves to pasture large flocks of sheep for the supply of the vallies and the towns on the coast.

Owing to the badness of the road, our progress had been so slow that it was long after dark when we arrived at a ravine, down which we continued to Huayllay, a small Indian town, and the centre of a mining district, eight leagues from Casa-cancha. The monotonous appearance of the hills among which we had travelled, at a very slow pace, the intolerable headache we suffered, and the benumbing cold of the evening wind, made this altogether a fatiguing and unpleasant day's journey.

One of our party, a Spaniard, conducted us to the house of the Governor, who was his countryman. He had been a soldier in the Spanish army, but having married an Indian woman of Huayllay, he settled in the town, where his intelligence and activity procured him the office of Governor; to which he added the profession of a miner, and the trade of a shop-keeper. Our apartment was in keeping with the mixed pursuits of the master of the house; the table was covered with papers relative to the number of recruits, and the tribute to be furnished by the Indians under his jurisdiction; a heap of silver ore occupied a corner of the mud floor, and candles, sugar, jars of spirits, and similar merchandise were spread around, with very little regard to arrangement. Our host and his dark lady vied with each other in ministering to our wants; and, stretched on the floor of their domicile, we soon forgot the *puna* and our tedious ride from Casa-cancha.

In the morning, we were again greeted by the glittering hoar-frost, which added to the desolate and wintry aspect of the town and surrounding hills, where not a tree nor a trace of cultivation was to be seen. All the corn and vegetables consumed by the inhabitants are brought up from the vallies, and have to be carried fifteen or twenty leagues.

Having arrived at Huayllay at night, we had not perceived

that the valley in which it stands passed through an extensive formation of *Trachyte*. A small stream runs in the bottom, from which a steep grassy slope rises on each side, surmounted by a craggy and precipitous wall of the *Trachyte* rocks. Half a league below the town, we passed some hot springs: the water leaves a calcareous deposit, which is gradually encroaching upon one side of the valley.

At the lower extremity of the valley, the *Trachyte* is divided into columns, coated with blackish *Lichen*, that from a distance gives them the appearance of *Basalt*. The masses have been very differently acted upon by the weather, some parts disintegrating more readily than others. Many columns stand alone; they are obliquely divided by transverse fissures, and the different joints have been unequally worn, so that a slender shaft sometimes supports an immense mass on its summit, and the whole has the appearance of architectural ruins, interspersed with grotesque colossal figures.

On emerging from the valley, we found ourselves at last on the plains of Bourbon, which extend fifteen or twenty leagues from north to south, presenting a surface of green sward as level as a bowling-green. We had now only to travel six leagues to the mines, situated among the hills on the opposite side of the plain. At the distance of two leagues, we passed a low belt of limestone, and we crossed three small rivers on our way. When we looked at the vast meadow over which we were travelling, bounded by gently swelling hills that shut out the view of the distant snowy peaks, we could hardly persuade ourselves that we were fourteen thousand feet above the level of the sea.

Having reached the further side of the plain, and crossed a range of limestone rocks, we came abruptly upon the town and mines of the Cerro de Pasco,* which occupy one side of an open space, about half a league across, and nearly

* *Cerro*, Hill. This name is given to the town situated among the hills, to distinguish it from the old town of Pasco, (*Pasco viejo*,) which stands at the edge of the plain, two leagues to the southward.

surrounded by rugged hills. The satisfaction we felt at having arrived at the end of our journey was increased upon entering a house fitted up by the Pasco Peruvian Company, and finding ourselves in a comfortable apartment, with boarded floor and glass windows, and a coal fire blazing in an English grate. Mr. M—— was the only one who continued to suffer from the *puna* after our arrival; he was seriously ill for some days, and confined to his room upwards of a week.

This celebrated spot, from which so much wealth has issued, has a wretched appearance; the town consists of narrow straggling lanes, the houses are small and dark, and the mass of the people squalid and miserable. Heaps of refuse from the mines surround the town, which is built immediately over some of them, and there are many shafts opening into the public roads without any fence or covering, so that, on a dark night, it is impossible to pass from one part of the town to another without imminent risk.

I was struck here, as at Huayllay, by the gloomy aspect of the scene, notwithstanding the sun was shining in the midst of a bright sky; but I soon perceived that the very clearness of the sky was the cause of this phenomenon. From the perfect transparency of the atmosphere, the sun's rays are unimpeded, and a dazzling light falls on objects directly exposed to their influence, while those that are in shade receive very little indirect light from the dark blue heavens; and thus, a striking contrast is produced between the glare of the illuminated surfaces and the unrelieved shade, very different from the effect of the diffused light in the hazy atmosphere of the coast. This gloomy effect is increased by the total absence of trees, and the general prevalence of sombre hues in the surrounding objects: the hills of bluish limestone, with the meagre unhealthy vegetation thinly scattered upon them; the stagnant lakes, buried in their recesses, and reflecting their darkened images; the decayed thatch of the houses; the grey and brown dresses of the Indians, whose dark faces are mottled with purple blotches from constant exposure to the bleak atmosphere of the

Cordillera, all conspire to increase the sadness of the scene, which looks as if a neutral tint were passed over the whole landscape. But all this is amply compensated by the beauty of the nights in fine weather, especially on the hills above the town, which command a view of the snowy ranges that surround the plains of Bourbon; the colour of the sky is deep indigo, and the stars shine with a splendour that can be but faintly conceived by those who have witnessed their brilliance on a clear frosty night in Britain.

Few plants are to be found in the immediate neighbourhood of Pasco; those which occur most frequently are grasses, a few *Gentians*, *Lupinus nubigenus*, and some *Compositæ*. The latter are generally found on the plains and without stems; the lower part of the flower being completely imbedded in the turf. The *pappus* of *Werneria rigida* is used as tinder. The *Gentians* are most common on the limestone rocks. The state of my health prevented me from proceeding to the vallies eastward of Pasco, which had been my intention when I left the coast: this was the more mortifying, as I was within two days journey of Huanuco, the centre of the district from which Ruiz and Pavon obtained the greatest part of their collections. While in Pasco, I received several letters from Dr. Pœppig, who crossed the Cordillera about a fortnight before us. He had suffered severely from the *puna*, and continued dangerously ill during the few days he remained in Pasco, from whence he passed on through Huanuco, to Pampayaca, the most remote estate on the river Hualluga. Previous to leaving Chili, this accomplished and enterprising Naturalist had spent eight months in exploring the interior of the province of Concepcion, and had examined the Flora of an extensive district in the mountains adjacent to the volcano of Antujo, where no Botanist had ever before penetrated. Dr. Pœppig's Chilian collections are among the most extensive and valuable ever made in South America. In Peru, his intention was to examine the productions of the country bordering on the river Hualluga, and then to endeavour to descend by that stream to the Amazons, and return by way of Para to Europe.

On the 24th of July, I made an excursion for a single day to Huayllay. Behind the town, large masses of *Trachyte* are piled on the face of the hill, and in the little sheltered spots between them, a luxuriant vegetation discovers itself, and many plants are found there that do not appear in more exposed situations, even where the elevation is much less. There were several fine ferns, and I gathered, besides, *Lycopodium crassum, Rubia hirta, Baccharis genistelloides* and *B. thyoides, Culcitium canescens*, a new *Alstrœmeria*, a species of *Atropa*, and a large yellow-flowered *Gentian*. There were likewise a few stunted shrubs, without flowers or fruit. All these occurred nearly on the same spot; and I have no doubt that a traveller, passing through Huayllay, who could devote a day or two to exploring the hills near the town, would find a great number of species, especially of ferns. I also procured at Huayllay, the fruit of the woolly *Cactus* before alluded to, which appears every where, from the pass of La Viuda to Pasco; it is eaten by the Indians, who call the plant *Huacura*. The fruit of *Alstrœmeria dulcis* is sought after by the children, on account of a sweet gelatinous pulp, resembling that of the pomegranate, in which its seeds are imbedded; the plant is called *Campanillas coloradas*, (*red bells*,) to distinguish it from the *Atropa*, found in the same places, to which they give the name of *Campanillas amarillas*, (*yellow bells*.) Among the ferns is an *Acrostichum*, which at Huayllay is called *Calaguala*; but the same name is given indifferently to many ferns used as substitutes for the genuine *Polypodium Calaguala*.

On the 28th of August, I set out on my return to Lima, where I arrived on the 2d of September. Above Culluay, I gathered *Calceolaria lobata*, and below that town, several other species were loaded with flowers. Among other plants that had flowered since June, were *Tacsonia trifoliata*, and a species of *Clematis*. On approaching Obrajillo, every thing was dried up, and from thence to the coast, there was scarcely a single plant in flower.

As the season advanced, I had an opportunity of observing the rapidity with which vegetation is arrested when the mist

is dissipated on the coast. At the end of September, I went from Lima to the valley of Lurin, six leagues to the southward. For the last two leagues, the road lies over a plain at the foot of the hills, which was completely covered with *Nolana prostrata* and *Palavia rhombifolia,* in full blossom. The day after my arrival at Lurin, the mist began to disperse, and for the following week, the sun shone brightly during a great part of the day. At the end of that time I returned to Lima, and not a single flower then remained on the plants, the whole of which were completely withered. I revisited Lurin a few days afterwards, when there was not a semblance of vegetable structure in their black and shrivelled remains; and a stranger would have thought it impossible, that, within a fortnight, the bare sandy soil could have been carpeted with such a profusion of flowers. The same effect was soon produced on the pasture in the hills; the summer of the coast had commenced; and when I left the country on the 4th of November, we heard that a heavy fall of rain had announced the winter of the interior.

In speaking of the climate of Chili, I omitted to allude to one circumstance connected with the vegetation of its mountains. At a medium elevation between the coast and the higher ranges of the Cordillera, especially on table-land, snow lies on the ground for some time after the rains have ceased, and, melting gradually at the beginning of summer, the soil continues moist, and vegetation is in full vigour in such situations, when every plant has withered in the neighbouring vallies. Some of the most beautiful productions of Chili, and those least known, occur on the hills thus situated.

From the peculiarities of climate in the various districts, both of Peru and Chili, the greater part of the indigenous plants flourish at a season, and under circumstances, peculiarly favourable to their cultivation in Britain, and other parts of the north of Europe. Most of them flower, not during the heat of summer, but in the winter or spring of the year, when the average temperature is certainly not

greater, and in some districts, is much less than that of the summer months in the latitude of London; and those of the coast of Peru have an additional recommendation as regards their culture with us, that they very seldom see the sun. In illustration of this, I may mention that *Palavia rhombifolia* and *Loasa hispida*, which inhabit the low country near Lima, succeeded perfectly in the open air at the garden of the Horticultural Society, during the wet and boisterous summer of the present year, 1830. It is true, that in the mountains of Peru, the plants are in flower during those months when the sun has most power; but there the altitude compensates in a great measure the difference of season.

In cultivating Chilian and Peruvian plants, the climate and progress of vegetation on the coast of the middle provinces of Chili may serve as a guide for their treatment, and it may be as well to take a short review of the leading phenomena. The rainy season, as already mentioned, begins in May, and continues till October; the heaviest rains are in June and July. After a few days of rain, there is an interval of fine weather for at least one or two weeks, and the quantity that falls during the season is small, varying from twelve to sixteen inches. In summer, the atmosphere is excessively arid, and there is little or no dew. The temperature at noon in the middle of the rainy season is generally about 60°; at night, seldom under 40°, though there is occasionally a little frost. In summer, the thermometer at noon stands between 70° and 75°; but during the night, in clear weather, it frequently falls more than 20°. During the latter part of summer, vegetation is almost dormant, and scarcely a plant of any kind is to be seen in flower; but in a very few weeks after the first rains, every part of the country is clothed with verdure. By the end of July many plants are in bloom, and a rapid succession of species continue to put forth their blossoms for several months, and the hills are adorned with many beautiful species of *Alstrœmeria*, *Calceolaria*, *Tropæolum*, *Amaryllis*, *Schizanthus*, *Oxalis*, *Sisyrinchium*, and other interesting genera. After the end of November, few of these remain in flower.

The principal objections to the climate of Britain, as regards the habits of these plants, is excessive humidity, rather than any defect of temperature; and to this circumstance the attention of those who are interested in their cultivation should be chiefly directed. From the hilly nature of the country they inhabit, and the moderate rains, the soil retains little moisture during the season they are in flower, and while they are seeding, the ground is perfectly dry and hard.

From what has been already said, it is evident that the period when a Botanist will find the greatest number of plants in blossom in the vallies and on the lower hills of Chili, especially in the middle and northern provinces, is between July and December, and he will experience little interruption to travelling, except while it is raining, and for a day or two afterwards from the swelling of the rivers. But in the south, the heavy rains render the roads almost impassable, and the traveller finds such indifferent accommodation, that little can be done before October; but as vegetation does not advance there so rapidly as in the north, an ample field presents itself for the four following months. In elevated spots throughout Chili, where snow remains at the end of the rainy season, many species will be found from December to the end of February.

The number of plants met with on the coast of Peru is small, and they are mostly in flower between the middle of June and the end of September, though some are to be found in the vallies all the year. In the mountains, as well on the eastern as the western side of the Cordillera, the best time for botanizing is from January till June, and at great elevations, several months later. But the roads are so bad that travelling is difficult while the rains continue, and the only plan for a collector at that season is, to fix his residence in some town or village, and, as the rain generally falls after noon, to make his excursion in the early part of the day.

It will give me great pleasure if these observations can be in any way useful to you, or tend in the slightest degree

to facilitate an acquaintance with the natural productions of one of the most interesting portions of the globe.

I am, my dear Sir, very faithfully, yours,

A. Cruckshanks.

[The following additional remarks came too late to be printed in their proper places.—*Ed.*]

It is chiefly in the middle province that the *Palm* of Chili (*Micrococcos*) is found. It is not a common tree, being very partially distributed; but several estates owe much of their value to the number of *Palms* upon them, and although the stem is useless, the leaves, sap, and fruit yield a large income to the proprietor. For thatching houses, the leaves are considered better and more durable than any other material; the sap, boiled down to a syrup, is used as a substitute for honey, and has a very agreeable flavour; and the small cocoa-nuts, about an inch in diameter, of which every tree produces a great number, are highly esteemed, and form a considerable article of export to Peru. A curious method is employed to free the nut from the green husk in which it is enveloped, a process that was formerly attended with a great loss of time and labour. A number of cows and oxen are driven into an enclosure, where a quantity of the fruit is spread, and being very fond of its husk, they immediately begin to feed on the fruit, only slightly masticating it in the first instance, and swallowing the whole; afterwards, while chewing the cud, the nuts are rejected; and when the meal is finished, a heap of them is found before each of the animals, perfectly free from the husk, the cattle being thus supplied with food at a season when little grass remains on the hills, at the same time that they effectually perform a very useful operation.

APPENDIX A.

While on this subject, I would say a few words on the question so often agitated, concerning the native country of the *Potatoe*. Mr. Lambert, in the 10th vol. of *Brande's Journal*, and in the Appendix to his splendid Work

on the genus *Pinus*, has collected many valuable facts, which prove that it is found wild in several parts of America, and among others in Chili and Peru. Don José Pavon, in a letter to Mr. Lambert, says, "The *Solanum tuberosum* grows wild in the environs of Lima, and fourteen leagues from Lima on the coast; and I myself have found it in the kingdom of Chili,"—and Mr. L. adds, "I have lately received from Mr. Pavon very fine wild specimens of *Solanum tuberosum*, collected by himself in Peru." There is also a note from Mr. Lambert on the same subject, in the 3d vol. of the *New Edin. Phil. Journ.* with an extract from a letter of Mr. Caldcleugh, who sent tubers of the wild plant some years ago from Chili to the Horticultural Society.

But it is frequently objected, that in some of those countries where the *Potatoe* is found wild, it may, like many other species met with in that state in America, be an *introduced*, not an *indigenous* plant. There are, however, many reasons for believing that it is really indigenous in Chili, and that the wild specimens found there have not been accidentally propagated from any cultivated variety. In that country, it is generally found in steep rocky places, where it could never have been cultivated, and where its accidental introduction is almost impossible. It is very common about Valparaiso, and I have noticed it along the coast for fifteen leagues to the northward of that port; how much farther it may extend north or south, I know not. It chiefly inhabits the cliffs and hills near the sea, and I do not recollect to have seen it at more than two or three leagues from the coast. But there is one peculiarity in the wild plant that I have never seen noticed in print, that its flowers are always *pure white*, free from the purple tint so common in the cultivated varieties, and this I think is a strong evidence of its native origin. Another proof may be drawn from the fact, that while it is often met with in mountainous places, remote from cultivated ground, it is not seen in the immediate neighbourhood of the fields and gardens where it is planted, *unless a stream of water run through the ground, which may carry tubers to uncultivated spots.*

Having observed the distribution of this and other plants through the agency of the streams employed for irrigating the land, I am led to think, that the wild specimens found near Lima, may have had similar origin. If they occurred in the valley, this is more than probable, as almost the whole of the land is either cultivated by irrigation, or the uncultivated spots are overflowed when the river is swelled by the rains in the interior. I remember a curious instance of this sort of vegetable colonization. In the vineyards of Chili, it is customary, in order to economize the land, to sow *Lucerne* among the vines, to the great injury of the latter, as it prevents the ground from being ploughed or hoed. An intelligent landowner who had travelled in France, and observed the beneficial effects of turning up and manuring the land, determined to adopt the same system in a large vineyard he was planting near Santiago, and gave orders

to his *Mayor Domo* not to sow *Lucerne* seed in it as usual. On visiting his estate some months afterwards, he was astonished to find the land covered with young plants of the forbidden pasture, although none had been sown; and on investigating the matter, it was found that the stream which irrigated his grounds passed first through several *Lucerne* fields in another part of the valley, from which it had carried and disseminated *seed* over the whole vineyard.

Humboldt, who has bestowed such unwearied attention on the subject of plants cultivated in the New World, (but whose work was published previous to that of Mr. Lambert) denies that the *Potatoe* is indigenous to Peru. In his *Essai politique sur le royaume de la Nouvelle Espagne*, he says, "J'observe d'abord pour ne consigner ici que des faits exacts, que la *pomme de terre* n'est pas indigène au Pérou, et qu'elle ne se trouve pas nulle part sauvage dans la partie de la Cordillère qui est située sous les tropiques. Nous avons, M. Bonpland et moi, herborisé sur le dos et sur la pente des Andes, depuis les 5° nord, jusqu, áux 12° sud; nous avons pris des informations chez des personnes qui ont examiné cette chaine de Montagnes colossales jusqu'a La Paz et á Oruro, et nous sommes sûrs que dans cette vaste étendue de terrain il ne végete spontanément aucune espèce de Solanée à racines nourissantes."—" M. M. Ruiz et Pavon, dont l'autorité est d'un grand poids, disent avoir trouvé la pomme de terre dans les terrains cultivés, *in cultis*, et non dans les forêts et sur le dos des montagnes," page 400. The last paragraph, however, is at variance with the letter of Don José to Mr. Lambert, and more appears to be inferred from what Ruiz and Pavon say on the subject in the *Flora Peruviana*, than those authors intended. The passage in that work, after the description of the *Solanum tuberosum*, is as follows:—" Habitat in Peruviæ et Chilensis Regni cultis, *et in collibus Chancay, ad Jequan et Pasamayo prædia*." If they had only found it in cultivated land, the first part of this passage would have been sufficient; but the context leaves it to be understood that that circumstance does not apply to its locality at Chancay.

Chancay is a town on the coast of Peru, which gives its name to the surrounding district or jurisdiction, in which the estates of Jequan and Pasamayo are situated, and it is doubtless the place alluded to in Don José's letter, being about the distance he mentions north of Lima. There is a great extent of cultivated land in the neighbourhood, irrigated from the river of Pasamayo, (called also the river of Chancay,) but Ruiz and Pavon say, they found the plant *in the hills*, where, as I have before observed, there is no cultivation. As nothing, however, is stated of the nature of the hills, nor of the height at which the plant occurs above the valley, there is still room to suspect that it may have been accidentally introduced, and, indeed, the Indians formerly brought water upon the land from a considerable distance, at a much greater elevation than any that is irrigated at the present day.

Upon the whole, it may be safely concluded that this important vegetable is really indigenous to Chili; but with respect to Peru, some further evidence appears necessary to remove all doubt on the subject. The question can only be decided by ascertaining the exact situations in which the plants present themselves at Lima and Chancay, especially with respect to land that is or has been cultivated. It would be interesting, too, to know the *colour* of the flowers.

NOTICE OF SOME OF THE PLANTS* COLLECTED DURING THE ABOVE EXCURSION.

By *W. J. H.*

DICOTYLEDONES.

I. RANUNCULACEÆ. *Juss.*

1. Clematis *sericea;* scandens, foliis ternatis aut pinnatis, foliolis (3–5) subobovatis acuminatis grosse serratis subtrilobis supra pubescentibus subtus sericeis, floribus umbellatis involucratis in *α.* pedunculo simplici subracemosim dispositis. *Humb. et Kunth, Nov. Gen. v.* 5. *p.* 37. *De Cand. Prodr. v.* 1. *p.* 5.—*β.* foliolis latioribus cordatis. *Humb. et Kunth.*

Hab. *β.* Between Obrajillo and Culluay, Valley of Canta.

If I am correct in referring this plant to the *Cl. sericea* Humb. and Kunth, it must belong to the var. *β., foliolis latioribus cordatis* of those authors. But the specimens described in the *Nova Genera,* seem to have been imperfect, and the plant itself is liable to much variation. In ours, the flowers are solitary, but there is a 2-leaved involucre, which, probably, occasionally produces more than one flower. The *flower* itself is large, an inch and a half and more in diameter,

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* In the subjoined List, I have confined myself to the plants preserved in the Herbarium. Many seeds were collected which have been distributed to different gardens; and several of the plants raised from them proved exceedingly interesting, and have been published by Dr. Graham in the *Edin. Phil. Journ.*, and by myself in the *Botanical Magazine.*—*Ed.*

sometimes bearing stamens only; at other times, both stamens and pistils, and these perfect. The *stamens* are three-fourths of an inch long: *filaments* compressed: *anthers* oblong, yellow. *Pistils* numerous: *style,* or *awn,* as long as the stamens, very silky, naked only above. The *leaves* are as described by M. Kunth; and the *stem* is angled and downy.

2. Ranunculus *Guzmannii;* foliis superne petiolisque villosis, radicalibus suborbiculatis trifidis, lobis apice grosse dentatis, superioribus 3-fidis lobis oblongis integris, caule erecto piloso paucifloro, calyce adpresso villosissimo. *DC.—Humb. Tabl. Phys. des Reg. Eq. p.* 69. *Humb. et Kunth, Nov. Gen. v.* 5. *p.* 43. *De Less. Ic. v.* 1. *t.* 34. *De Cand. Prodr. v.* 1. *p.* 29.—*β. nanus*; foliis profunde partitis.

Hab. β. Pastures at Pasco.

The solitary specimen of this plant, brought home by Mr. Cruckshanks, agrees well with Humboldt's description and with De Lessert's figure, except that the stem is scarcely 4 inches high, and the leaves are very deeply divided. The roots are fasciculated, a span long.—This is a truly alpine species of *Ranunculus.* It is among the plants noticed by M. de Humboldt in describing the vegetable features, at different elevations, of the æquinoctial regions. "Still higher," he says, "namely at an elevation of 3500 métres, (1796 toises,) the arborescent plants terminate. It is only at the volcano of Pichincha, in a narrow valley which descends from Guaga-Pichincha, that we have discovered a groupe of arborescent syngenesious plants, whose trunks attain to 7 or 8 métres, (21 or 24 Parisian feet.) To between 2000 and 4100 métres, (1026 to 2103 toises,) the region of alpine plants extends: it is that of the *Stæhelinas,* of the *Gentians,* of the *Espeletia frailexon,* whose downy leaves afford shelter to the unhappy Indians who are benighted in these regions. The turf is there adorned with the *Lobelia nana,* the *Sida Pichinchensis,* the *Ranunculus Guzmannii,* the *Ribes frigidum,* the *Gentiana Quitensis,* and many other species which will

be described in our '*Plantes équinoxiales.*' The *Molinas* are those suffruticose plants which we have met with at the greatest elevation on the volcano of Purasé, near Popayan, and on that of Antisana.

" At the height of 4100 métres, (2103 toises,) the alpine plants give place to the *Grasses*, of which the region extends to 4600 métres, (2360 toises.) The *Jaravas*, the *Stipas*, a multitude of new species of *Panicum*, *Agrostis*, and *Dactylis* cover the soil; and present, at a distance, a golden carpet, which the inhabitants call *pajonal*. The snow falls occasionally in this region of *Grasses*.

" At 4600 métres, (2360 toises,) there are no phænogamous plants under the Equator. From this line to that of perpetual snow, the *Lichens* alone cover the rocks. Some even appear to conceal themselves under the eternal ice; for at 5554 métres (2850 toises) of elevation towards the summit of Chimborazo, I have found upon a projecting rock *Umbilicaria pustulata*, and *Verrucaria geographica*: these are the last organized forms that we have observed attached to the soil at these great heights."

From this interesting statement, it will be seen that our *Ranunculus Guzmannii* is reckoned amongst the most elevated of the phænogamous plants; and, indeed, in the *Nova Genera*, it is stated to have been gathered by Guzman upon the mountain Chorazon, district of Quito, at an elevation of 2430 toises, and near the limits of perpetual snow.

II. PAPAVERACEÆ. *Juss.*

1. Argemone *rosea;* glaucescens, ubique aculeato-hispida, foliis bipinnatifidis spinosis, capsula anguste ovata aculeis erectis numerosissimis obsita, stigmate 4–5-lobo.

Hab. Mines of Arqueros; Coquimbo; Chili; (Sandwich Islands. *Mr. Menzies.*)

It is now clearly ascertained, that more than one species has been confounded with the *Argemone Mexicana.* The *A. albiflora*, *sulfurea*, and *grandiflora*, are, I believe, justly considered as permanently distinct. To these I think

we may safely add the present one, whose leaves, especially about the nerves, stems, and calyx, are thickly clothed with patent aculei, and whose capsule is so entirely covered with them that nothing but the stigma is seen. The colour of the flower, which is here of a delicate rose tint, may possibly vary; yet as colour appears constant in other species, it will probably prove so in this. It is perhaps not uncommon in the countries of the Pacific. I possess the same species, gathered by Mr. Menzies in the Sandwich Islands: and it is probably the *A. Mexicana* of Schlechtendal and Chamisso, in the 1st vol. of the Linnæa, p. 552. This they unite with one from the Philippine Isles, and with an East Indian species from Dr. Roxburgh, and say that it differs from the Brazilian plant, "caule sæpe numero spinis reversis horridissimo, capsula copiosioribus minoribusque spinis obsita, quæ in Americanæ majores sunt et parcæ."—The true *A. Mexicana* is indeed also found in Chili, and I have very fine specimens from Valparaiso, sent by Mr. Bridges, retaining all their true characters.

III. CAPPARIDEÆ. *Juss.*

1. Gynandropsis *pentaphylla;* glabriuscula, foliis mediis 5-foliolatis, infimis floralibusque 3-foliolatis, foliolis integris subserrulatisve. *De Cand. Prodr. v.* 1. *p.* 238.—Cleome pentaphylla. *Linn. Sp. Pl. p.* 938. *Bot. Mag. t.* 1681. *Spreng. Syst. Veget. v.* 2. *p.* 122.

Hab. Lurin, near Lima.

IV. POLYGALEÆ. *Juss.*

1. Monnina *nemorosa;* foliis elliptico-oblongis acutis mucronatis (vel obtusis) basi angustatis et revolutis obsolete denticulatis subvenosis crassiusculis glabris, junioribus ramulisque pubescentibus, racemis bifidis simplicibusve. *DC.—Humb. et Kunth, Nov. Gen. p.* 410. *t.* 504. *De Cand. Prodr. v.* 1. *p.* 339. *Spreng. Syst. Veget. v.* 3. *p.* 175.—Hebeandra mucronata. "*Bonpl. Ges. Berl.* 1808. *p.* 40."

The figure of Humboldt and Kunth, above quoted, so well resembles this plant, that I can scarcely think they can

be other than the same species: at the same time, the leaves, in my specimens, are more obtuse, and all of them, even the older ones, are slightly downy. In the foliage and racemes, our plant agrees with the *M. obtusifolia*, Humb. and Kunth, but that is described as having its leaves and branches glabrous. De Candolle well observes of this genus, "species plurimæ non satis notæ."

2. Krameria *cistoidea;* caule fruticoso ramoso, foliis oblongis mucronatis sericeis, pedicellis folio longioribus bibracteatis racemum brevem efformantibus, sepalis petalisque 5, staminibus 4. *Hook. et Arn. in Bot. of Beechey's Voy. v.* 1. *p.* 8. *t.* 5.

HAB. Mines of Arqueros, near Coquimbo.

For remarks on this plant, and on the structure of its flower, see the work above quoted.

V. MALVACEÆ. *Juss.*

1. Sida *reflexa;* foliis subrotundo-cordatis acuminatis crenatis tomentosis, pedicellis solitariis petiolo longioribus, petalis cuneiformibus apice dentatis reflexis, carpellis 12. *DC.—Cav. Diss.* 1. *p.* 36. *t.* 7, *et* 6. *t.* 195. *f.* 1. *De Cand. Prodr. v.* 1. *p.* 469. *Spreng. Syst. Veget. v.* 3. *p.* 119. —S. retrorsa. *L'Hérit. Stirp. v.* 1. *t.* 64.

HAB. Yazo; in the Valley of Canta.

The *Abutilon pedunculare* of Humb. and Kunth seems to be very nearly allied to the present species, and is perhaps not really distinct from it.

2. Sida *Dombeyana;* foliis cordatis acuminatis dentato-serratis parce pilosis, pedicellis solitariis unifloris petiolo longioribus, carpellis 5 birostratis, caule prostrato hirsuto. (TAB. LXXXIX.)—S. Dombeyana? *De Cand. Prodr. v.* 1. *p.* 463.

HAB. Lurin, near Lima.

Annua. *Caules* prostrati, teretes, virides, patentim pilosi, pedales et ultra. *Folia* remotiuscula, exacte cordata, acuminata, basi profunde lobata, crenato-serrata, membranacea, utrinque parce pilosa: *Petioli* folio breviores,

ad basin utrinque stipula parva subulata suffulti. *Pedunculi* axillares, solitarii, gracillimi, biunciales et ultra, petiolo longiores, supra medium articulati, glabri. *Calyx* lato-campanulatus, membranaceus, 5-fidus; laciniis brevibus acutis; marginatus, striisque 10 elevatis notatus, extus subpilosus. *Petala* cuneata, flava, basi purpurea. *Columna staminea* brevis. *Antheræ* uniloculares. *Styli* 5, filiformes, inferne coadunati. *Carpella* 5, piloso-scabra, cornubus duobus, longis, rectis terminata.

The *Sida Dombeyana* of De Candolle is a native of the vicinity of Lima, as is this plant; and, as far as can be judged from the exceedingly short character of that author, they may be the same. The only points at variance are, that the stems can hardly be called filiform, and that the leaves are not ovato-cordate, but truly and broadly heart-shaped. Hence I have quoted the above synonym with a mark of doubt.

Tab. LXXXIX. Sida Dombeyana. *Fig.* 1, Calyx, inclosing the fruit. *Fig.* 2, 3, Back and front view of two carpels: —*magnified.*

3. Sida *floribunda;* foliis cordatis ovato-oblongis acuminatis serratis utrinque molliter villoso-pilosis, subtus fuscescenti-canescentibus, racemis axillaribus, carpellis 5 muticis (potius breviter birostratis.) *DC.—Humb. et Kunth, Nov. Gen. v.* 5. *t.* 473. *De Cand. Prodr. v.* 1. *p.* 465.

Hab. Lurin, near Lima.

This seems to be too nearly allied to *S. paniculata,* as De Candolle himself inclines to think, and to the *S. atrosanguinea, Jacq. Ic. t.* 136, with which Sprengel unites it, (as he does also the *Abutilon pedunculare* of Humb. and Kunth,) making it a species distinct from *S. paniculata.* The flowers are, in a dried state, blackish-purple.

VI. BUTTNERIACEÆ. *Br.*

1. Waltheria *ovata;* foliis subrotundo-ovatis inæqualiter dentatis tomentosis, capitulis sessilibus. *DC.—Cav. Diss.* 6.

p. 317. *t.* 171. *f.* 1. *De Cand. Prodr. v.* 1. *p.* 493. *Spreng. Syst. Veget. v.* 3. *p.* 31.

HAB. Lurin, near Lima.

VII. GERANIACEÆ?

I. CRUCKSHANKSIA. (*Nov. Gen.*)

GEN. CHAR. *Cal.* 5-sepalus, sepalis lanceolato-acuminatis, æstivatione imbricatis, basi unitis bracteatis. *Cor.* pentapetala, hypogyna, petalis obcordatis vix unguiculatis. *Stam.* 10, hypogyna basi monadelpha. *Antheræ* subulato-lanceolatæ, loculis marginalibus longitudinaliter dehiscentibus. *Germen* solitarium, 5-loculare, polyspermum; *Ovula* receptaculis centralibus affixa. *Stigma* sessile, magnum, 5-partitum, laciniis ellipticis, erectis, marginibus reflexis.—Frutices *parvæ ramosæ, ramis oppositis.* Folia *opposita tri-bi-foliolata, integerrima.*—Nomen dixi in honorem amicissimi *Alexandri Cruckshanks,* Arm., qui plantas varias seminaque in America meridionali detexit atque mihi benevole communicavit.

1. Cruckshanksia *cistiflora.* (TAB. XC.)

HAB. Coquimbo, in Chili.

Frutex, ut videtur, parva, ramosa, *ramis* oppositis, foliosis, junioribus subpubescentibus. *Folia* opposita, parva, bi- vel plerumque tri-foliolata, petiolis brevibus; foliolis oblongis ovalibusve, obtusis, uninerviis, integerrimis, margine revolutis, utrinque pilis brevibus appressis pubescentibus. *Flos* terminalis, solitarius, pedunculatus, bracteatus; bracteis 3–4 ad basin calycis, foliis similibus sed majoribus, 3-4-foliolatis; foliolis lanceolatis magis minusve acuminatis. *Calyx* 5-sepalus; sepalis basi unitis, lanceolatis, acuminatis, pubescenti-hirtis, æstivatione imbricatis, demum reflexo-patulis. *Corolla* magna, speciosa, flava, pentapetala, hypogyna. *Petala* patentia, subrotundo-obcordata, retusa, unguibus brevibus. *Stamina* hypogyna, 10, basi monadelpha, alterna subbrevioribus: *Filamenta* subulata, brevia, glabra: *Antheræ* lineari-subulatæ, filamentis longiores; loculis lateralibus appositis,- longitudinaliter dehiscentes. *Pistillum* solitarium. *Germen*

lato-ovatum, dense hirsutum, 5-loculare, polyspermum. *Receptaculum* seminum singulo loculo axile, longitudinale, ovulis tectum. *Stigma* sessile, magnum, 5-partitum, laciniis ellipticis, erectis, marginibus recurvis.

Among the many interesting plants brought by Mr. Cruckshanks from Chili and Peru, none has struck me as being more remarkable than the present; and, believing as I do, that it constitutes a genus hitherto undescribed, I wish it should bear the name of my valued friend, its discoverer. It is to be regretted that the fruit is still a desideratum; for, with my present limited knowledge of its fructification, I am unable to refer it to any established Order. In many points it agrees with *Geraniaceæ;* but, as far as can be inferred from the germen, the fruit would possess a very different character, and in habit it is at variance with every known individual of that family; unless the *Macræa* of Mr. Lindley, and of the present Work, (*v.* 1. *p.* 174. *t.* 50.) may be said to belong to the *Geraniaceæ*, to which Cambassedes, under the name of *Cæsarea*,* has referred it without any doubt. That genus, like the present, has, besides its opposite leaves, and a sufficient resemblance in the calyx, corolla, germen, and nearly sessile stigma, *anthers* which open laterally:—but these anthers have their cells approximate; the *germen* is only 3-celled, and each cell is only 2-seeded. Still I think *Cruckshanksia* will rank better with *Macræa* than with any known genus.

Tab. XC. Cruckshanksia cistiflora. *Fig.* 1, Bud, with its bracteæ. *Fig.* 2, Corolla and stamens, including the pistil, taken out from the bud. *Fig.* 3, Three stamens from the bud, to show that they are monadelphous at the base. *Fig.* 4, Perfect stamen. *Fig.* 5, Pistil. *Fig.* 6, Section of do. *Fig.* 7, 8, Leaves:—more or less *magnified.*

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* The two species of *Cæsarea* described by Cambassedes, *albiflora* and *rubriflora*, are natives of Brazil; yet assuredly of the same genus as *Macræa*, (*Viviania* of Cavanilles, according to Mr. Don.)—It is remarkable, too, that in Brazil one species is white, another red-flowered, as in Chili.

VIII. TEREBINTHACEÆ. *Juss.*

1. Schinus *Molle. Linn.—De Cand. Prodr. v.* 2. *p.* 74.

Hab. Lurin, near Lima.

The flowering specimen of this plant, with its narrow leaflets, has a very different appearance from what is cultivated in our gardens, and which I have never known to flower. If the leaves of this species, and others of this family, called *Molle* by the natives, be broken into small pieces and thrown upon water, they exhibit, and for a considerable length of time, the most extraordinary movements; owing to the essential oil escaping from the wounds; which, by the resistance it meets with in the water, forces the fragments of leaf in the opposite direction.

IX. LEGUMINOSÆ. *Juss.*

1. Crotalaria *incana. Linn.—Cav. Ic. v.* 4. *t.* 322. *De Cand. Prodr. v.* 2. *p.* 132.

Hab. Lurin, near Lima.

2. Indigofera *Truxillensis;* fruticosa, ramosissima, ramulis ferrugineo-strigosis, foliis pinnatis, foliolis 5–6-jugis oblongis obtusis mucronatis, basi cuneatis, (præsertim subtus) strigosis, racemis multifloris subsessilibus folio brevioribus, leguminibus reflexis, teretiusculis, subfalcatis, 4–6-spermis. *Humb. et Kunth, Nov. Gen. Am. v.* 6. *p.* 457. *De Cand. Prodr. v.* 2. *p.* 226.

Hab. Lurin.

3. Dalea *cylindrica;* procumbens, glabriuscula, foliolis 6-jugis obovatis submucronatis subtus punctatis, pedunculis oppositifoliis folio triplo longioribus, spicis cylindraceis densis, bracteis ovatis concavis mucronatis, calyce nigro-punctato glabro bractea longiore, laciniis lato-subulatis ciliatis.

Hab. Valley of Canta.

Caulis procumbens, ramosus, gracilis, inferne fruticosus, pallide fuscus, glaber, superne herbaceus subsericeus. *Folia* triuncialia, juniora subsericea, demum glabra, 6–7-juga, foliolis obovatis obscure mucronatis, subtus glanduloso-

punctatis, petiolulo brevissimo ad basin uniglanduloso. *Stipulæ* subulato-setaceæ, glabræ, atro-fuscæ. *Pedunculi* oppositifolii et terminales, folio triplo longiores, teretes, glabriusculi, tactu subscabri. *Spicæ* nutantes (an semper?) 3–4 unciales, cylindraceæ, compactæ. *Bracteæ* membranaceæ, ovatæ, mucronatæ, concavæ, dorso nigro-virides, subglandulosæ, margine diaphano scarioso, calycis longitudine. *Calyx* glaber, membranaceus, striis decem nigris, inter strias glandulis oblongis nigris, dentibus nigris, lato-subulatis, rectis, tubo duplo brevioribus, marginibus intus ciliato-sericeis. *Corolla* ut videtur cærulea.

This *Dalea* has considerable affinity with the Mexican *D. mutabilis*, Cav., (*D. bicolor*, Willd.); but that has much shorter spikes and a calyx free from those oblong black glands, which are so conspicuous in the present individual. *D. Mutisii*, Kunth, approaches still nearer to it; only that there the mucro of the bractea, and the teeth of the calyx, are vastly longer, and the leaves are characterised as hairy. *D. Onobrychis*, again, of De Candolle, a Peruvian plant, has the spikes ovato-cylindrical and villous.

4. Astragalus *Garbancillo*, Cav.? suffruticosus? foliolis 10–12-jugis subvillosis oblongis obtusis bidentatisque, stipulis concretis oppositifoliis, racemis pedunculatis folio longioribus, calycibus nigro-villosis, leguminibus inflatis pilosis. *Cav. Ic. v.* 2. *p.* 59. *t.* 85. *De Cand. Prodr. v.* 2. *p.* 283.

Hab. In the Valley of Canta.

The present plant belongs to a tribe of the extensive genus *Astragalus*, having the stipules not adnate with the petiole, but united opposite to the leaf at their base; thus being bidentate. Of this groupe, three are natives of Peru; *A. Garbancillo*, Cav., *A. bidentatus*, Humb. et Kunth, *Nov. Gen. Am. v.* 6. *t.* 584, and *A. unifultus*, L'Hérit. and De Cand. *Astrag. t.* 10. These have a great affinity the one with the other; and the present plant of Mr. Cruckshanks, though not exactly agreeing with any one of them, I dare not consider as really distinct, especially from the former of the

three, which comes also from the same part of Peru. The only specimen I possess is apparently herbaceous; in which respect it differs from Cavanilles' plant, which is called "*fruticose*": there, too, the leaves are simply obtuse; here, mostly bidentate, as in the *A. bidentatus* of Humb. The present is a much more straggling plant than L'Héritier's and Humboldt's, judging from the figures. It is not unlikely, however, that all might with propriety be united with the *Garbancillo.* The specific appellation is derived from the provincial name of the plant; and it is stated to be injurious to cattle.

5. Æschynomene *Americana. Linn.—Lam. Ill. t.* 729. *f.* 2.

HAB. Lurin, near Lima.

6. Desmodium *Limense;* caule erecto sulcato hirsuto, foliis longe petiolatis ternatis, foliolis oblongo-ovatis supra glabriusculis subtus appresso-hirsutis, racemis terminalibus axillaribusque longis, bracteis ovatis acuminatis sericeis, leguminibus flexuosis, articulis 5–8 ovalibus hirsuto-scabris.

HAB. Near Lima.

In a genus so extensive as the present, it is not easy to say to which species this is the most nearly allied, or whether it be indeed distinct from some already described. In many respects, however, it accords with *Hedysarum cajanifolium,* Humb. *Nov. Gen. t.* 598; but that is remarkable for the paniculated racemes, which in our plant are remote and solitary, mostly arising from the axils of the leaves. The general shape and size of the leaflets, and the flowers and fruit, appear to be the same in both.

7. Vicia *bidentata;* glaberrima, foliolis bi-tri-jugis oppositis alternisve oblongis basi cuneatis apice bidentatis cum mucrone intermedio, cirrho simplici, stipulis lato-semisagittatis subdentatis, pedunculo folium æquante bi-trifloro, leguminibus oblongis glabris.

HAB. Lurin, near Lima.

This has the habit of *V. humilis,* Humb. et Kunth, *Nov. Gen. t.* 581, but it is taller, a foot or more high, glabrous in

every part. The leaflets are larger, bi- rarely tri-dentate, (excluding the mucro,) the flowers are smaller, not solitary, two or sometimes three growing on a peduncle.

8. Phaseolus *Truxillensis;* volubilis, ramulis petiolisque retrorsum pilosis, foliolis ovatis angustato-acuminatis obsolete cordatis adpresso-pubescentibus, racemis longis pedunculatis, calycis lobis inferioribus acutis, lateralibus subfalcatis, superiore latissimo emarginato. *Humb. et Kunth, Nov. Gen. v.* 6. *p.* 451. *De Cand. Prodr. v.* 2. *p.* 391.

HAB. Lurin, near Lima.

If, as I believe, I am correct in referring this plant to Humboldt's *P. Truxillensis,* that species has the (young) legumes clothed with adpressed hairs, and much flattened.

9. Phaseolus *vestitus;* volubilis, ubique dense pubescenti-hirsutus, foliolis rhomboideis retusis lateralibus sublobatis, racemis folio duplo longioribus, calycis dentibus lato-subulatis subæqualibus, leguminibus lineari-acuminatis villosissimis.

HAB. Lurin, near Lima.

Caules pilis patenti-reflexis densissime obsiti. *Foliola* sesquiunciam longa, juniora sericeo-velutina, dein pubescenti-subtomentosa, subtus pallida, retusa cum brevi mucrone. *Petiolus* folii longitudine. *Pedunculus* longus. *Flores* mediocres, atro-purpurei (ut videtur, ex sicco.) *Calyces* pilosissimi. *Legumen* 3 uncias longum, 2 lineas latum, compressum, valde acuminatum.

10. Dolichos *glycinoides;* caule volubili, ramulis petiolisque retrorsum pilosiusculis, foliolis ovato-oblongis obtusis mucronatis basi rotundatis trinerviis strigulosis, pedunculis longissimis paucifloris, calycis lobis acutiusculis, labio superiore latissimo subemarginato. *DC.—Humb. et Kunth, Nov. Gen. v.* 6. *p.* 101. *De Cand. Prodr. v.* 2. *p.* 398.

HAB. In the Valley of Lima.

The leaves of this plant are variable; those of the young shoots having linear leaflets. The legumes are reflexed and subtorulose, but compressed, clothed with brownish hairs.

11. Lupinus *nubigenus;* acaulis, (corollis exceptis) flavescenti-sericeis, foliolis 9–11 cuneato-lanceolatis mucronato-acutis, stipulis lineari-subulatis, racemo denso subsessili, floribus erectis, calycis segmentis longe subulatis sericeo-villosis. *Kunth, Pl. Legum. p.* 174. *t.* 50. *Humb. et Kunth, Nov. Gen. v.* 6. *p.* 480. *De Cand. Prodr. v.* 2. *p.* 408.

Hab. Near Pasco.

This plant agrees better with the figure above quoted than with the description. The foliage is beautifully silky, not woolly; nor do I find the bracteas to be longer than the flowers.

12. Mimosa *sensitiva. Linn.—Bot. Reg. t.* 25. *De Cand. Prodr. v.* 2. *p.* 427.—Mimosa albida. *Kunth, Pl. Legum. p.* 2. *t.* 1. *De Cand. Prodr. v.* 2. *p.* 426.

Hab. Valley of Lima.

Mimosa sensitiva of Linn. is considered as a native of the Eastern Coast of South America; *M. albida* of Willd., of the West. To me these species appear identical. The pubescence on the foliage is unquestionably variable, and Mr. Cruckshanks' specimens seem to unite the two, in having some of the petioles aculeated and others unarmed.

13. Hoffmanseggia *Falcaria. Cav. Ic. t.* 392. *De Cand. Prodr. v.* 2. *p.* 485.—*β.* caule petiolis calycibus foliorumque marginibus glandulis pedicellatis obsitis.

Hab. *β.* At Yazo, in the Valley of Canta.

I am doubtful whether this ought not to rank as a distinct species, from the copious, pedicellated, brown glands, with which almost the whole plant is covered; and which do not exist in my cultivated specimens from the Montpellier Garden, or those from the Andes of Chili, both on the eastern and western side, gathered by Dr. Gillies, or in others from Lima.

14. Cassia *calycioides? De Cand. in Coll. Mon. Cass. p.* 125. *t.* 20. *f.* B. *De Cand. Prodr. v.* 2. *p.* 503.

Hab. Lurin, near Lima.

My specimens differ from the figure and description of *C. calycioides*, only in having the peduncles supra-axillary instead of axillary. I possess, however, from Lima, in Gouan's Herbarium, a specimen marked "*Guaranguillo*" of the natives, which agrees in every particular with De Candolle's plant.

15. Bauhinia *grandiflora;* spinis stipularibus, foliis rotundatis basi cordatis 8–9-nerviis lobis brevibus obtusis subtus calyce ramulisque pubescentibus, pedunculis axillaribus uni-trifloris, (floribus maximis), bracteolis subulatis, staminibus corolla brevioribus. (Tab. XCI.)—*Juss. in Poir. Encycl. Suppl. p.* 600. *De Cand. Prodr. v.* 2. *p.* 513.

Hab. Lurin, near Lima.

Arbor; ramis subangulatis, fusco-purpureis, glabris, ramulis pubescentibus, ad basin petiolorum spina valida flavescente inferne pubescente. *Folia* ampla, lato-rotundata, 4–6 uncias lata, basi cordata, 7–9-nervia, apice bifida, sinu lobisque obtusis, supra glabra, subtus pubescentia. *Petioli* superne plani, ad basin utrinque stipula subulata, decidua. *Racemus* axillaris, 1–3-florus, bracteolis longis subulatis. *Calycis* pubescentis tubus longus striatus, limbo lateraliter fisso æque longo. *Petala* magna, 4 uncias longa, unciam lata, lato-lanceolata, venosa. *Stamina* 10, quorum 5 longiora sterilia.

Hitherto this fine species of *Bauhinia* appears only to have been known from Dombey's specimens in the Museum at Paris. In the size of its flowers, it is perhaps surpassed by no species.

Tab. XCI. Branch of Bauhinia grandiflora:—*natural size.*

X. ROSACEÆ. *Juss.*

1. Alchemilla *tripartita;* hirsuta, caule repente filiformi dichotome ramoso superne folioso, foliis profunde tripartitis segmentis cuneatis 3–5-fidis, stipulis inæqualiter bifidis, pedunculis dichotome corymbosis, floribus diandris digynis. *Ruiz et Pav. Fl. Per. v.* 1. *p.* 68. *De Cand. Prodr. v.* 2. *p.* 590.

Hab. Obrajillo, in the Valley of Canta.

Ruiz and Pavon have omitted to notice the silky appressed hairs of the stem, and especially of the underside of the leaves of this plant, yet I think it is evident the species are identical. In many respects, also, it agrees with *A. hirsuta* of Humboldt and Kunth.

XI. ONAGRARIÆ. *Juss.*

1. Epilobium *denticulatum*. *Ruiz et Pav. Fl. Per. v.* 3. *p.* 78. *t.* 314. ? *De Cand. Prodr. v.* 3. *p.* 42.

HAB. Sulinarca, near Pasco.

I am doubtful if this be the *E. denticulatum*, because, though it agrees with Ruiz and Pavon's description in most of its characters, it can hardly be considered "*suffruticose*." It is, too, smaller than the figure above quoted.

2. Jussiæa *macrocarpa*. *Humb. et Kunth, Nov. Gen. v.* 6. *p.* 102. *t.* 533. *De Cand. Prodr. v.* 3. *p.* 57.

HAB. Lurin, near Lima.

This entirely agrees with the figure and description of *J. macrocarpa*, which, however, was found in New Grenada, by Humboldt.

XII. PASSIFLOREÆ. *Juss.*

1. Passiflora *littoralis*; foliis utrinque piloso-sericeis hastato-trilobis subintegris, petiolis superne glandulas 2 stipitatas (vel sessilibus?) gerentibus, pedicellis 2–3.—*Humb. et Kunth, Nov. Gen. v.* 2. *p.* 131. *De Cand. Prodr. v.* 3. *p.* 323.

HAB. Valley of Lima.

This accords with Humboldt and Kunth's description, except that in my specimens the glands of the petioles are sessile, or nearly so.

2. Tacsonia *trifoliata*; tota velutino-sericea tomentosa, foliis ternatis, foliolis oblongis integerrimis, petiolis eglandulosis, stipulis amplexicaulibus glanduloso-ciliatis.—*Juss. in Ann. du Mus. v.* 6. *p.* 393. *De Cand. Prodr. v.* 3. *p.* 334.

HAB. Culluay, in the Valley of Canta.

The flowers are here as large as in *T. pinnatistipula*, of

which I have specimens, gathered in Chili by Dr. Gillies; but the foliage is much more beautiful.

XIII. MALESHERBIACEÆ. *Don.*

1. Malesherbia *thyrsiflora;* foliis lineari-lanceolatis acutis sinuato-dentatis pubescenti-tomentosis, calycis longe tubulosi fauce coarctata, corona 10-fida, laciniis 2–4-dentatis. *Ruiz et Pav. Prodr. p.* 45. *Cav. Ic. t.* 375. *De Cand. Prodr. v.* 3. *p.* 338.

HAB. Yazo, in the Valley of Canta.

This, and the preceding plant, are among the handsomest in this interesting collection.

XIV. LOASEÆ. *Juss.*

1. Loasa *contorta;* foliis oppositis petiolatis oblongis runcinatis acutis basi subcordatis, pedicellis unifloris e dichotomiis, fructu spiraliter sulcato, caule scandente. *Lam. Dict. v.* 3. *p.* 579. *Juss. Ann. du Mus. v.* 5. *t.* 3. *f.* 1. *De Cand. Prodr. v.* 3. *p.* 340.

HAB. Culluay, in the Valley of Canta.

The flowers are large and yellow, and the scales, which alternate with the petals, are large and inflated.

2. Loasa *incana;* suffruticosa, suburens, caule suberecto ramoso foliisque sparsis petiolatis ovato-lanceolatis inciso-serratis scabris, pedunculis simplicibus oppositifoliis. *Graham in Ed. N. Phil. Journ. Dec.* 1830. *Hook. in Bot. Mag. t.* 3048.

HAB. Yazo, in the Valley of Canta.

3. Mentzelia *aspera. Linn. Sp. Pl. p.* 516. *Plum.* (*ed. Burm.*) *t.* 174. *f.* 1.

HAB. Yazo, in the Valley of Canta.

My specimens of *M. oligosperma*, from North America, gathered by Mr. Nuttall, seem to be scarcely different from the Linnæan *M. aspera.*

XV. PORTULACEÆ. *Juss.*

1. Portulaca *pilosissima;* annua? parva, caulibus ramosis decumbentibus, foliis teretibus oblongis, pilorum fasciculis folio duplo triplove longioribus.

Hab. Yazo, in the Valley of Canta.

In this plant, the leaves, and the flowers, too, are almost wholly concealed by the long, white, and silky tufts of hairs arising from their axillæ. The *P. lanata* of Richard, from Cayenne, approaches this in the length of its hairs, but the leaves appear different.

XVI. RUBIACEÆ. *Juss.*

1. Rubia *hirta;* caule tetragono hirto, foliis quaternis brevipetiolatis ovali-oblongis uninerviis acutis hirtis, pedunculis axillaribus oppositis 1-floris vix folio brevioribus, flore in involucro tetraphyllo sessili, baccis scabris glabris. *Humb. et Kunth, Nov. Gen. v.* 3. *p.* 338. *De Cand. Prodr. v.* 4. *p.* 592.

Hab. Huaylluay, near Pasco.

XVII. LOBELIACEÆ. *Juss.*

1. Lobelia *biserrata;* suffruticosa, foliis numerosis ovato-lanceolatis subsessilibus inæqualiter serratis subtus canescenti-tomentosis, floribus axillaribus solitariis pedunculatis, "filamentis basi corollæ adnatis." *Cav. Ic. v.* 6. *p.* 10. *t.* 514. *Roem. et Sch. Syst. Veget. v.* 5. *p.* 43.—*β. spicata;* foliis superioribus confertioribus, floribus racemum spiciformem compactum efformantibus.

Hab. Obrajillo, in the Valley of Canta. *β.* Yazo, in the same valley.

In the var. *β.* of this noble plant, the leaves, which are often five or more inches long, become gradually smaller upwards, so that the erect flowers, though axillary in these smaller leaves, yet in reality form a large compact spiked raceme. The flowers are more ventricose in the upper part of the tube, than the figure in Cavanilles represents them to be; and the segments of the limb are much longer: two of them are recurved in front of the oblique mouth of the corolla, and three behind.

XVIII. COMPOSITÆ. *Juss.*

I. CICHORACEÆ.

1. Prænanthes? *subdentata;* caule subramoso parce folioso,

foliis lanceolatis inferioribus inferne longe attenuatis rarius sinuato-dentatis supremis integerrimis basi amplexicaulibus, involucro cylindraceo, radice repente.

HAB. Lurin, near Lima.

Of this, there is only one specimen with a single flower, and that not very perfect, so that I refer it, doubtfully, to the genus *Prænanthes.* The root is long and creeping. Lower leaves 6–7 inches long; those of the stem 3–4, becoming smaller upwards, and amplexicaul.

II. CARDUACEÆ.

(* ONOSERIDEÆ. *Kunth.*)

2. Homanthis *pinnatifidus;* acaulis, foliis pinnatifidis, scapis unifloris, foliolis involucri exterioribus dentato-spinosis. *Humb. et Kunth, Nov. Gen. v.* 4. *p.* 308.—Chætanthera pinnatifida. *Humb. et Bonpl. Pl. Æq. v.* 2. *p.* 170. *t.* 136.

HAB. Mountains, about Pasco.

3. Mutisia *viciæfolia. Cav. Ic. v.* 5. *p.* 62. *t.* 490. *Pers. Syn. Pl. v.* 2. *p.* 453.

HAB. Obrajillo, in the Valley of Canta.

Flowers more than 4 inches long.

BRIDGESIA. (*Nov. Gen.*)

GEN. CHAR. *Involucra* biserialia, basi unibracteata, plurima in globum congesta, triflora; squamis biserialibus, 1 exterior, 4 interiores. *Corollæ* bilabiatæ, labio *exteriore* oblongo 3-dentato: *interiore* bipartito, laciniis linearibus reflexis. *Pappus* subplumosus.—Herbæ *lanuginosæ.* Flores *in capitulis globosis collecti.*

4. Bridgesia *echinopsoides.* (TAB. XCII.)

Caulis ramosus, herbaceus, teres, ubique lanuginosus. *Folia* 4–5 uncias longa, pinnatifida, basi amplexicaulia, aurita, laciniis lato-ovatis, sinuato-dentatis, marginibus subrecurvis, supra nudiuscula, subtus niveo-tomentosa, nervosa. *Flores* axillares terminalesque. *Involucra* pentaphylla, basi squama seu bractea suffulta, in globum unciam

diametro arcte congesta. *Bracteæ* ovatæ, acutæ, extus tomentosæ. *Involucri squamæ* 5, biseriales: *exterior* rigida, ovato-acuminata, valde concava, gibbosa, uniflora, flore abortivo; *reliquæ* 4 membranaceæ, floribus duobus, 3 exteriores medio glandula longitudinali notatæ. *Corollæ* albæ, tubo involucro sub duplo longiore sursum latiore, limbo bilabiato; labio superiore oblongo-ovato, reflexo, tridentato; inferiore bipartito, laciniis linearibus, reflexis. *Stamina* 5: *Antheræ* basi bisetosæ. *Stigmata* revoluta. *Achenia* obovata, glabra. *Pappus* pilis subplumosis.

HAB. Culluay, in the Valley of Canta.

Amongst all the genera of *Labiatifloræ*, I am unable to find any which accords with the present plant, here named in compliment to Mr. Bridges, who has already sent many excellent plants from the western side of the Andes of South America, and from whose exertions much more may be expected. In habit it very much resembles some species of *Echinops*. Each head of flowers contains a great number of involucres, (mixed with bracteæ,) which are regularly 3-flowered: the outermost scale of the involucre, which is the largest and most rigid, always contains, within its deeply hollowed base, one imperfect flower; within that are 4 scales containing 2 perfect flowers. The section of a flower, (*fig.* 1,) will give a better idea of the relative situation of the scales of the involucre and bracteas, than can be done by words.

TAB. XCII. *Fig.* 1, Transverse section of a flower, with the bractea at its base, showing the relative position of the 5 scales, or leaflets, of the involucre, 4 external and 1 internal. *Fig.* 2, Involucre, with its 3 florets, and the bractea at the base. *Fig.* 3, One of the innermost flowers. *Fig.* 4, Portion of a hair of the pappus. *Fig.* 5, External scale of the involucre, with its abortive flower. *Fig.* 6, Portion of a hair from the pappus of the latter:—*magnified.*

III. VERNONIACEÆ.

5. Baccharis *genistelloides;* aphylla, suffruticosa, caule ram-

isque trialatis, alis articulatim interruptis reticulatis, floribus lateralibus terminalibusque. *Pers. Syn. Pl. v.* 2. *p.* 425. *Humb. et Kunth, Nov. Gen. v.* 4. *p.* 67.—Conyza genistelloides. *Lam. Encycl. v.* 2. *p.* 93. *Willd. Sp. Pl. v.* 3. *p.* 1947.—"Molina reticulata. *Ruiz et Pavon.*"—*β. resinosa;* caule ramis involucrisque resinoso-glutinosis. (Tab. XCIII.)

Hab. Huaylluay, near Pasco.

Radix subfusiformis, lignosa. *Caules* plurimi ex eadem radice, erecti, ramosi, aphylli, ad basin nudi, dein ramique late 3-alati; alis rigidis, coriaceis, sinuato-lobatis et quasi articulatis, reticulatis, marginatis, resinosis, ramorum apicibus sphacelatis. *Flores* nunc laterales solitarii, nunc terminales aggregati, sessiles, hemisphærici. *Involucrum* e squamis linearibus obtusis imbricatis. *Flosculi* tubulosi, minutissimi, inconspicui. *Germen* oblongum, striatum. *Pappus* sessilis, pilis, sublente, scabris.

Tab. XCIII. Baccharis genistelloides. *Fig.* 1, Portion of the stem with a flower. *Fig.* 2, Floret. *Fig.* 3. Portion of the hair from the pappus:—*magnified.*

6. Baccharis *thyoides;* fruticosa, ramis distichis, foliis semiamplexicaulibus ovatis acutis carinatis distiche imbricatis intus lanosis, floribus solitariis sessilibus terminalibus. (Tab. XCIV.)—*Lam. Dict. v.* 2. *p.* 90. *Illustr. t.* 607. *f.* 5. *Pers. Syn. Pl. v.* 2. *p.* 425.

Hab. Huaylluay, near Pasco. *Vern. name, Parqui.*

Frutex bipedalis et ultra. *Caules* erecti, inferne solummodo nudiusculi, teretes, dein ramosi; ramis ramulisque alternis, distichis, brevibus, tomentosis, compressis. *Folia* distiche imbricata, in caule remota, in ramis arcte disposita, ovata, vel oblongo-ovata, acuta, insigniter compressa et carinata, glabra, intus concava, basique laxe tomentosa. *Flores* sessiles, terminales, in ramis ramulisque solitarii. *Involucrum* e squamis paucis, oblongis, imbricatis, erectis, obtusis, glabris. *Flosculi* parvi, 5-dentati, *exteriores* ad basin squama lineari, *interiores* nudi. *Germen* oblongum. *Pappus* simplex, sessilis.

This and the preceding plant are among the most remarkable brought by Mr. Cruckshanks from Chili. While the former resembles, in its winged leafless stems, the *Genista segetalis*, the present has more the appearance of some *Cupressus*, than of a plant of the Nat. Ord. *Compositæ*. The branches and leaves are beautifully and regularly distichous; the latter being glabrous externally, and woolly within, as are the stems and branches.

TAB. XCIV. Baccharis thyoides. *Fig.* 1, Flowering branch. *Fig.* 2, Leaf. *Fig.* 3, Floret, with a scale from the receptacle :—*magnified.*

IV. EUPATORIEÆ.

7. Stevia *puberula;* herbacea, erecta, pubera, apice corymbosa, foliis alternis sessilibus ovalibus basi apiceque acutis obtuse serratis triplinerviis, involucro glanduloso, pappo aristis subnovem scabris.

HAB. Obrajillo; Valley of Canta.

The corymbs are dense, even at the top: flowers apparently white or flesh-coloured. Allied, perhaps, to *S. ovata,* Lag.

V. JACOBEÆ.

8. Dumerilia *paniculata;* foliis suborbiculatis septemlobis dentatis subtus dense tomentosis, paniculis amplis dense corymbosis terminalibus. *De Cand. Ann. du Mus. d'Hist. Nat. v.* 19. *p.* 72. *t.* 7. *Humb. et Kunth, Nov. Gen. v.* 4. *p.* 156.

HAB. Obrajillo; Valley of Canta.

9. Culcitium *canescens;* albido-tomentosum, caule ramoso multifloro, foliis radicalibus lanceolato-oblongis acutiusculis, caulinis lanceolato-linearibus, floribus erectiusculis. *Humb. et Bonpl. Pl. Æq. v.* 2. *p.* 4. *t.* 67. *Humb. et Kunth, Nov. Gen. v.* 4. *p.* 172.

HAB. Huaylluay, near Pasco. *Vern. name, Colac.*

I scarcely see how this is to be distinguished from the *C. rufescens,* except by the colour of its down: this is so dense on every part of the plant, that nowhere are the nerves visible, as represented in the figure of the root-leaf, in the plate above quoted.

10. Senecio *volubilis;* scandens, glabriusculus, foliis oblongo-ovatis sublonge petiolatis repando-dentatis basi acutis cordatisve, paniculis dense corymbosis in ramos breves terminantibus.

Hab. Lurin, near Lima.

Habit of a *Cacalia.* Its nearest affinity is probably with the *S. macrophyllus* of Humb. and Kunth; but that species has a pair of stipules at the base of the petiole, which does not exist in the present.

11. Werneria *rigida;* foliis stellato-imbricatis linearibus obtusis, involucro sub 13-fido subcolorato. *Humb. et Kunth, Nov. Gen. v. 4. p.* 191.

Hab. Pasco.

VI. HELIANTHEÆ.

12. Spilanthes *albus. L'Hérit. Stirp. p.* 7. *t.* 4. *Pers. Syn. Pl. v.* 2. *p.* 393.

Hab. Lurin, near Lima.

13. Wiborgia *parviflora. Humb. et Kunth, Nov. Gen. v.* 4. *p.* 256.—Galinsogea parviflora. *Cav. Ic. v.* 3. *p.* 41. *t.* 281. *Willd. Sp. Pl. v.* 3. *p.* 2228.—Wiborgia Acmella. *Roth.* —Bidens mercurialis, &c. *Feuill. Per. v.* 1. *p.* 744. *t.* 32.

Hab. Lurin, near Lima.

In the large teeth of the leaves, this resembles the *W. urticifolia* of Humb. and Kunth; but the fruit is crowned with linear scales.

14. Wiborgia? *oblongifolia;* tota planta pilis appressis albis aspera, foliis oblongo-lanceolatis triplinerviis grosse serratis basi attenuatis subsessilibus, involucro polyphyllo, receptaculi squamis linearibus hispidis, pappo piloso brevissimo.

Hab. Lurin, near Lima.

Herbacea, valde ramosa (ramis oppositis) atque foliosa. *Folia* 2–4-pollicaria, rigidiuscula. *Pedicelli* duas uncias longi, axillares, solitarii. *Involucrum* hemisphæricum, imbricatum, squamis oblongis, obtusis, æqualibus. *Corollæ* radii bidentati.

This will probably prove a genus distinct from *Wiborgia*, with which it somewhat agrees in habit; but it differs in the many-leaved involucre, in the linear, or almost setaceous and hispid scales of the receptacle, the narrow bidentate *corollas* of the ray, and the *pappus* composed simply of short indistinct hairs.

15. Unxia *dissecta;* herbacea, erecta, pilosa, foliis ternatis, foliolis tripartitis laciniatis in petiolulum attenuatis, flosculis disci et radii circiter 5.

Hab. Lurin, near Lima.

This has the closest affinity with *U. anemonifolia* of Humb. and Kunth, *Nov. Gen. v.* 4. *t.* 402, nor do I know that it can properly be separated from it. I have done so on account of the leaves, which are simply tripartite and laciniated in the latter; in our plant really ternate, the divisions being stalked, and those again much divided, and deeply laciniated.

XIX. MYRSINEÆ. *Br.*

1. Myrsine *Manglilla;* foliis elliptico-oblongis coriaceis obtusis glabris subtus pallidioribus, floribus aggregatis axillaribus pedunculo duplo brevioribus. *Br. Prodr. p.* 533. *Roem. et Sch. Syst. Veget. v.* 4. *p.* 509.—Bumelia Manglillo. *Willd.* —Sideroxylon and Chrysophyllum. *Lam.*—Manglilla. *Juss.*

Hab. Lurin, near Lima; where it is known under the name of *Manglilla*, and is employed as the most common fuel.

XX. GENTIANEÆ. *Juss.*

1. Gentiana *thyrsoidea;* caule simplici valido, foliis longis linearibus acutis, floribus aggregatis axillaribus (verticillatis?) racemum densum efformantibus, corolla campanulata 5-fida nuda calycem vix excedente.

Radix perennis, fusiformis, digitis crassitie, longe descendens. *Caulis* fere pedalis, erectus, simplex, validus, inferne nudus, sed reliquiis basium foliorum vetustorum cicatricatus. *Folia* numerosa, 3-4 uncias longa, anguste linearia, acuta, pungentia; *inferiora* reflexa; *superiora* magis remota et quasi verticillata, patentia. *Flores* numerosi, aggregati,

breve pedicellati, ut videtur verticillati, erecti, racemum longum densum latum efformantes. *Calyx* quinquefidus, laciniis lineari-lanceolatis tubi longitudine. *Corolla* campanulata, 5-fida, laciniis ovatis erecto-patentibus, fauce nuda. *Stamina* medio tubi inserta: *Antheræ* oblongæ, filamentis paulo longiores. *Germen* cylindraceum. *Stylus* perbrevis. *Stigma* transversum, canaliculatum.

HAB. Huaylluay, near Pasco.

The whole plant turns nearly black in drying.

2. Gentiana *incurva;* caule inferne nudo superne folioso, foliis ellipticis acutis, floribus axillaribus in apicem caulis aggregatis, corollis obovatis 5-fidis laciniis obtusis incurvis calyce subduplo longioribus.

HAB. Huaylluay, near Pasco.

The specimens of this plant are destitute of root. The stem, about 5 inches high, is leafy only above: the leaves an inch long, somewhat fleshy. Corolla an inch long, yellow, obovate.

3. Gentiana *saxifragoides?* *Humb. et Kunth, Nov. Gen. v.* 3. *p.* 168.

HAB. Pasco.

If I am correct in referring this to the *G. saxifragoides*, the leaves are sheathing at the base in a very remarkable manner, a circumstance not noticed by the authors above quoted. Flowers yellow.

4. Gentiana *rupicola.* *Humb. et Kunth, Nov. Gen. v.* 3. *p.* 167. *t.* 220. *f.* 2.

HAB. Pasco.

The description of G. *rupicola* agrees better with our specimens than does the figure, which represents the flowers too large.

5. Gentiana *sedifolia.* *Humb. et Kunth, Nov. Gen. v.* 3. *p.* 173. *t.* 225.—G. cæspitosa. *Willd. Herb.—Roem. et Sch. Syst. Veget. v.* 6. *p.* 185.

HAB. Pasco.

In this, the leaves and calyx have a beautiful white cartilaginous margin: the flowers are blue, externally streaked with darker lines.

XXI. BIGNONIACEÆ. *Juss.*

1. Tecoma *sambucifolia. Humb. et Kunth, Nov. Gen. v.* 3. *p.* 143.

Hab. Below Obrajillo; Valley of Canta.

2. Argylia *radiata. Don, in Ed. Phil. Journ. v.* 9. *p.* 261.—Bignonia radiata. *Linn.—Feuill. Obs. v.* 2. *t.* 22.

Hab. Mines of Arqueros, near Coquimbo, Chili.

I introduce this plant, though gathered in Chili, not only because it came in the same collection with the Peruvian plants, but because it has hitherto been considered to be a native only of Peru.—A *Bignoniaceous* plant, much allied to this in habit, and with long fruit, but with ternate leaves, found by Mr. Cruckshanks at Corillos de Uspallata, may probably prove a second species of this beautiful genus.

XXII. CONVOLVULACEÆ. *Juss.*

1. Convolvulus *secundus. Ruiz et Pav. Fl. Per. v.* 2. *p.* 10. *t.* 117. *f.* 2, (non *Desrouss.*)—C. unilateralis. *Roem. et Sch. Syst. Veget. v.* 4. *p.* 284.

Hab. Between Santa Rosa and Yazo; Valley of Canta.

XXIII. BORAGINEÆ. *Juss.*

1. Heliotropium *Peruvianum. Linn.—Curt. Bot. Mag. t.* 141.

Hab. Valley of Canta.

2. Heliotropium *microcalyx. Ruiz et Pav. Fl. Per. v.* 2. *p.* 3. *t.* 109. *f. b. Roem. et Sch. Syst. Veget. v.* 4. *p.* 33.

Hab. Lurin, near Lima.

3. Heliotropium *synzystachium. Ruiz et Pav. Fl. Per. v.* 2. *p.* 3. *t.* 109. *f. a.*—Tournefortia synzystachya. *Roem. et Sch. Syst. Veget. v.* 4. *p.* 539.

Hab. Lurin, near Lima.

4. Heliotropium *curassavicum. Linn.—Willd. Enum.—Lehm. Asperif. p.* 34. *n.* 15. *Roem. et Sch. Syst. Veget. v.* 4. *p.* 32.

HAB. Lurin, near Lima.

5. Cordia *rotundifolia*. *Ruiz et Pav. Fl. Per. v.* 2. *p.* 24. *t.* 148. *f. a. Humb. et Kunth, Nov. Gen. v.* 3. *p.* 70.—C. lutea. *Lam.*

HAB. Lurin, near Lima.

XXIII. SOLANEÆ. *Juss.*

1. Nicotiana *glutinosa. Linn.—And. Bot. Rep. t.* 484.

HAB. Lurin, near Lima.

2. Atropa *biflora;* fruticosa, glabra, foliis geminis late ovatis acutis nervosis in petiolum brevem decurrentibus, pedunculis subbifloris, staminibus corollam hirsutam tubulosam excedentibus, calyce 5-fido. *Ruiz et Pav. Fl. Per. v.* 2. *p.* 43. *t.* 181. *f. b. Roem. et Sch. Syst. Veget. v.* 4. *p.* 684.

HAB. Between Obrajillo and Culluay, Valley of Canta.

3. Atropa *glandulosa;* caule fruticoso foliisque geminis cordato-ovatis longe petiolatis calyceque profunde 5-partito pubescenti-glandulosis, corolla longe tubulosa staminum longitudine.

HAB. Huaylluay, near Pasco.

Caules, ut videtur, procumbentes, fruticosi, teretes, subgeniculati, ramosi, ramis pubescenti-glandulosis. *Folia* e caulis geniculis gemina, unciam sesquiunciam longa, cordato-ovata, obtusa, obscure nervosa, integerrima, utrinque pubescenti-glandulosa. *Petiolus* folii longitudine glandulosus. *Pedunculus* lateralis, plerumque axillaris, 2–4 lineas longus. *Calyx* 4–5 lineas longus, profunde 5-partitus, glandulosus, laciniis lineari-subulatis, erectis. *Corolla* 3-uncialis, hypocrateriformis potius quam infundibuliformis, glabra, (siccitate) nigricans, limbo 5-fido; laciniis patentibus, ovatis, subacuminatis, parce glandulosis. *Stamina* tubo paulo longiora: *Filamenta* oblongo-linearia. *Germen* ovatum, pluri-ovulatum, in stylo filiformi corollæ tubo subæquante attenuatum: *Stigma* depresso-capitatum.

This, if I am correct in referring it to the genus *Atropa*, is perhaps the only species that inhabits cold mountain-districts: it is very distinct from every hitherto described one, being remarkable for its glandular and apparently viscid leaves and branches, for the great length of the tube of the corolla, and for its 5-partite calyx.

4. Nicandra *physalodes. Gærtn.*—Atropa physalodes. *Linn.*—Calydermos erosus. *Ruiz et Pav.*—Alkakengi, &c. *Feuill. Obs. v.* 2. *t.* 16.

HAB. Lurin, near Lima.

5. Witheringia *phyllantha;* caule herbaceo alato, foliis pilosis cuneiformibus angulato-lobatis decurrentibus, racemis e foliis nascentibus. *Dunal, Sol.*—Solanum phyllanthum. *Cav. Ic. v.* 4. *p.* 35. *t.* 359. *f.* 1.

HAB. Lurin, near Lima.

6. Witheringia? *salicifolia;* fruticosa, ramis elongatis, foliis anguste lanceolatis acuminatis integerrimis vel superne serratis, pedunculis solitariis vel binis axillaribus unifloris.

HAB. Lurin, near Lima.

Of the genus of this I am doubtful. In habit, it ill accords with the few species of *Witheringia* with which I am acquainted. The *stems* are twiggy, glabrous, and, as well as the long narrow-lanceolate leaves, much resemble some *Willow* or *Lycium*. The *flowers* are scarcely so large as those of *Solanum Dulcamara*. The *calyx* is deeply 5-cleft, with lanceolato-subulate segments. The *corolla* rotate. *Stamens* 5, spreading: *anthers* opening longitudinally. *Germen* globose, 2-celled, many-seeded, with the *seeds* arranged upon receptacles attached to the dissepiment: *style* short: *stigma* capitate, furrowed.

7. Lycopersicon *esculentum. Dunal.*—Solanum Lycopersicum. *Linn.*

HAB. Valley of Lima.

8. Solanum *amblophyllum;* fruticosum, foliis oblongis obtusis coriaceis glabris integerrimis subtus in venarum axillis solummodo tomentosis, racemis terminalibus subumbellatis, floribus (fructuque) nutantibus, calycis glabri lobis 5

rotundatis, corollis 5-partitis laciniis patentibus marginibus pubescentibus.

Hab. Obrajillo, in the Valley of Canta.

The leaves of this are 3–4 inches long; petioles scarcely an inch. *Fruit* round, glabrous, the size of a cherry, having at its base the 5 persistent rounded obtuse lobes of the calyx.

9. Lycium *arborescens;* fruticosum, foliis obovatis acutis basi in petiolum attenuatis subtus præcipue pubescentibus, umbellis sessilibus axillaribus, corolla infundibuliformi limbo revoluto. *Spreng. Syst. Veget. v.* 1. *p.* 701.—Atropa arborescens. *Linn.*—Lycium aggregatum. *Ruiz et Pav. Fl. Per. v.* 2. *p.* 45. *t.* 182. *f. a.*—Cestrum campanulatum. *Lam.*

Hab. Lurin, near Lima.

10. Browallia *elata. Linn.—Curt. in Bot. Mag. t.* 34.

Hab. Between Yazo and Obrajillo, Valley of Canta.

In these specimens, most of the peduncles bear many flowers in a leafless raceme: but I can still consider it only a var. of *B. elata,* and it seems very questionable, again, if that be distinct from *B. demissa.* The *B. grandiflora* of *Bot. Reg. t.* 1384, appears to me as if it were raised from Mr. Cruckshanks' seeds of this plant, rather than from the true *B. grandiflora* of Dr. Graham.

11. Browallia *viscosa. Humb. et Kunth, Nov. Gen. v.* 2. *p.* 373.

Hab. Valley of Canta.

This has much smaller leaves than the other species of *Browallia,* and they, and the whole plant except the corolla, are covered with glandular viscid down. The inflorescence may be said to be in leafy *racemes,* rather than in solitary, axillary, 1-flowered *peduncles.* The *peduncles* are thrice as long as the calyx.

XXIV. SCROPHULARINEÆ. *Juss.*

1. Buddlea *occidentalis. Linn.—Ruiz et Pav. Fl. Per. v.* 1. *p.* 53. *t.* 82. *f. a.*

Hab. Lurin, near Lima.

In my specimens the leaves are almost rhomboid, acuminate at both extremities, and nearly, if not quite, as broad as in *B. Americana*, Ruiz and Pav. *t.* 82. *f. b.*

2. Mimulus *luteus. Linn.*—Gratiola, &c. *Feuill. Obs. v.* 2. *t.* 34.—var. *rivularis. Lindl. in Bot. Reg. t.* 1030.

HAB. Mines of Arqueros, Coquimbo.

3. Calceolaria *verticillata;* suffruticosa, foliis ternis ovato-cordatis reticulatis glabris inæqualiter dentatis, paniculis oblongis compactis bracteatis, corollæ labio inferiore sub-patulo basi elongato. *Ruiz et Pav. Fl. Per. v.* 1. *p.* 17.

HAB. Valley of Canta.

4. Calceolaria *deflexa;* suffruticosa, glabra, viscosa, foliis oppositis ovato-lanceolatis acuminatis breviter petiolatis argute serratis deflexis, corymbis amplis foliosis, pedicellis nutantibus. *Ruiz et Pav. Fl. Per. v.* 1. *p.* 18. *t.* 30. *f. b.*

HAB. Culluay, Valley of Canta.

This is a very beautiful species, bearing numerous, large, deep-yellow *flowers; leaves,* which are clammy, dark-green above, pale beneath; and *stems* which are 4-sided, and of a blackish-purple colour.

5. Calceolaria *rugosa. Ruiz et Pav. t.* 28. *f. b. Bot. Mag. t.* 2523.

HAB. Below the Mines of Arqueros, Coquimbo.

6. Calceolaria *purpurea? Graham in Bot. Mag. t.* 2775.

HAB. Below the Mines of Arqueros, Coquimbo.

The specimens of this plant quite agree in size, habit, and foliage, with native ones of *C. purpurea* of Graham; but the *corymbs* are more numerous and more dense, and the *flowers* smaller, and, as far as can be judged in the dried state, rather inclining to a fulvous than to a purple colour.

7. Calceolaria *bicolor. Ruiz et Pav. Fl. Per. v.* 1. *p.* 16. *t.* 25. *f. b. Graham in Bot. Mag. t.* 3036.

HAB. Valley of Canta.

8. Calceolaria *lobata;* caule erecto superne dichotome corymboso, foliis longe petiolatis cordatis quinquelobis, lobis

acutis dentatis subtus præcipue pubescenti-hirsutis. *Cav. Ic. v. 5. p. 26. t. 443. f. 1.*

HAB. Culluay, in the Valley of Canta.

Cavanilles' figure and description give an idea of a more tomentose plant than is the case with our specimens. The *petioles*, indeed, are clothed with rather copious hairs.

9. Lamourouxia *bartsioides;* ubique pubescens ramosa, foliis lineari-oblongis obtusis crenato-pinnatifidis scabris, bracteis lanceolatis corolla brevioribus, floribus in spicam oblongam congestis.

HAB. Valley of Canta.

This has much the habit, and even the foliage, of *Bartsia viscosa*, or *Rhinanthus Crista-Galli;* but the calyx is cylindrical, and the corolla, so far as I can judge from the dried specimen, is that of a *Lamourouxia*.

XXV. LABIATÆ. *Juss.*

1. Salvia *strictiflora;* glabriuscula, superne glanduloso-pubescens, viscida, foliis firmis cordatis serratis, bracteis ovali-oblongis calyce subbrevioribus, floribus erectis, corolla pilosa, stylo longe exserto.

Caules erecti, tetragoni, herbacei, ramosi; *juniores* pubscenti-glandulosi, viscidi, demum glabri. *Folia* primum pube compacto tecta; *adulta* glabra, subcoriacea, petiolata, cordata, acutiuscula, subgrosse serrata. *Spicæ* pedunculatæ, terminales, erectæ, strictæ. *Flores* erecti, stricti, decussatim oppositi. *Bracteæ* fere unciam longæ, erectæ, deciduæ, glanduloso-pubescentes, striatæ, herbaceæ, calyce cylindraceo striato glanduloso breve-bilabiato parum breviores. *Corolla* tubulosa, leniter curvata, calyce duplo fere triplo longior, cinnabarina, pilis copiosis patentibus flavis obsita. *Antheræ* lineares, exsertæ. *Stylus* filiformis, longe exsertus.

HAB. Between Yazo and Obrajillo, in the Valley of Canta.

I can neither find in Ruiz and Pavon, nor in any other author, a *Salvia* which will agree with this. It is remarkable for having the adult stems and leaves glabrous; the latter of a

rigid, somewhat coriaceous texture; for the long, erect *spikes*, with large, erect *bracteæ;* the opposite solitary *flowers*, and its long-scaled *corolla*, clothed with yellow hairs.

2. Salvia *rhombifolia;* caule herbaceo bifariam piloso erecto ramoso, foliis subrhomboideo-cordatis subacutis rugosis subtus præcipue pubescentibus crenato-serratis, racemis terminalibus, verticillis remotis, corollæ labio inferiore ampliato patente, staminibus longe exsertis, bracteis parvis ovatis deciduis. *Ruiz et Pav. Fl. Per. v.* 1. *p.* 26. *t.* 36. *f. b. Graham in Ed. N. Phil. Journ.* 1830.—β. *minor;* foliis magis ovatis, calycibus valde pubescentibus.

Hab. Lurin, near Lima. β. Obrajillo, in the Valley of Canta.

3. Stachys *speciosa;* fruticosa, ramosissima, ramis erectis glabris, foliis ovatis glabriusculis crenato-serratis breve petiolatis subtus impresso-punctatis, petiolis paulo supra basin articulatis, verticillis paucifloris foliosis subspicatis, calycibus cylindraceis hirsutis corolla pilosa subquadruplo brevioribus, filamentis longioribus exsertis.

Hab. Below Obrajillo, in the Valley of Canta.

This is a very beautiful species, with leaves scarcely an inch long, while the fine purple *corollas* are nearly twice that length. *Style* much exserted. *Anthers* subreniform, the cells separated by a fleshy *connectivum.*

4. Teucrium *nudicaule;* herbaceum, erectum, ramis virgatis, foliis parvis remotis pubescentibus profunde trifidis segmentis linearibus obtusis integerrimis, supremis seu bracteis tripartitis, floribus spicato-racemosis, calyce brevicampanulato corollaque valde pubescenti-hirsutis.

Hab. Valley of Canta?

The exact station of this plant, I have, by some accident, lost. The species is a very remarkable one. The branches in my possession are about a foot and a half long, and seem to be but a small portion of the plant. The pairs of *leaves* are, in the older portions of the stem, three and four inches apart, not half an inch long, and always deeply trifid. *Calyx* with

five, nearly equal teeth, erecto-patent. *Corolla* and *stamens* as in the genus; lower lip much deflexed, thickly downy.

5. Perilomia *ocymoides*. *Humb. et Kunth, Nov. Gen. v.* 2. *p.* 328.

Hab. Obrajillo, near Canta.

XXVI. VERBENACEÆ. *Juss.*

1. Lippia *asperifolia*. *Rich.—Spreng. Syst. Veget. v.* 2. *p.* 751. *Humb. et Kunth, Nov. Gen. v.* 2. *p.* 265.—Verbena globiflora. *L'Hérit. Stirp. p.* 23. *t.* 12.—Xapania odorata. *Pers. Syn. v.* 2. *p.* 140.

Hab. Lurin, near Lima.

XXVII. ACANTHACEÆ. *Juss.*

1. Ruellia *floribunda;* glanduloso-pubescens, ramis teretibus, foliis cordato-rotundatis integerrimis brevi-petiolatis, paniculis axillaribus oppositis paucifloris, pedicellis unifloris, bracteis ovatis, calycis lacinia unica latiore, corollis læviter pubescentibus.

Valde ramosa, *caule ramisque* teretibus foliisque pubescenti-glandulosis. *Folia* opposita, unciam ad sesquiunciam longa, brevissime petiolata, cordato-rotundata nonnunquam lato-ovata, integerrima, acutiuscula. *Paniculæ* axillares, oppositæ, bis terve dichotomæ, pedicellis unifloris, flore in axilla solitario. *Bracteæ* ovatæ, oppositæ, sessiles. *Calyx* valde glandulosus, quinquepartitus, laciniis longitudine æqualibus, unica latiore. *Corolla* infundibuliformis, subcurvata, ut videtur purpurea, subpubescens, limbo 4-lobo patente, lobo superiore bifido. *Filamenta* 2 longiora exserta. *Antheræ* lineares, biloculares. *Stylus* longe exsertus, filiformis. *Germen* oblongum, disco carnoso impositum. *Capsula* longitudine calycis, oblonga, acuta, nitida, fusca.

Hab. Santa Rosa de Quiva, in the Valley of Canta.

XXVIII. NYCTAGINEÆ. *Juss.*

1. Boerhaavia *scandens*. *Linn. Sp. Pl. p.* 7. *Jacq. Vind. v.* 1. *p.* 2. *t.* 4. *Ruiz et Pav. Fl. Per. v.* 1. *p.* 4. *Humb. et Kunth, Nov. Gen. v.* 2. *p.* 216.

Hab. Valley of Lima.

XXIX. AMARANTHACEÆ. *Juss.*

1. Alternanthera *nigriceps;* erecta? ramis elongatis appresso-hirsutis, foliis subsessilibus ovatis acutis strigoso-hirsutis, capitulis oblongo-ovalibus longe-pedunculatis, perianthii laciniis lanceolatis bracteisque acuminatissimis glabris nitidis, rachi pilosa.

Hab. Obrajillo, in the Valley of Canta.

This is, probably, a tall growing plant; with remote pairs of leaves, an inch and a half in length. *Peduncles* long, with one terminal spike, and, more rarely, a lateral one also, about an inch long, remarkable for its dingy and nearly black glossy hue. The *rachis* is very hairy. *Bracteæ* ovate, almost cuspidato-acuminate. *Flowers* crowded. *Tube* of the stamens cylindrical, much longer than the *pistil,* with five 1-celled linear *anthers,* and as many barren laciniæ alternating with them. *Germen* globose: *Style* short: *Stigma* capitate.

Hab. Obrajillo, in the Valley of Canta.

XXX. CHENOPODEÆ. *Juss.*

1. Chenopodium *paniculatum;* suffruticosum, ramosum, foliis petiolatis ovato-triangularibus acutis integris farinosis, paniculis terminalibus, ramis simplicibus patentibus inferioribus solummodo parce foliosis, floribus glomeratis sessilibus.

Hab. Lurin, near Lima.

II. MONOCOTYLEDONES.

I. AMARYLLIDEÆ. *Br.*

1. Alstrœmeria *dulcis;* erecta, simplex, foliis erectis lineari-lanceolatis striatis margine revolutis superne glabris subtus pubescentibus, floribus 1-4 terminalibus nutantibus, perianthii laciniis 3 exterioribus oblongo-lanceolatis obtusis, 3 interioribus lato-spathulatis. (Tab. XCV.)

Radix longe repens, hic illic tuberifera. *Caulis* erectus, aut basi solummodo decumbens, simplex, spithamæus ad pedalem, inferne nudus, dein subarcte foliosus, apice incurvus. *Folia* erecta, basi oblique torta, lineari-lan-

ceolata, acuta, striata, superne glabra, subtus pubescentia, marginibus insigniter revolutis. *Flores* terminales, sæpe solitarii, nunc 3–4 subumbellati, nutantes, sesquiunciam longi. *Perianthii laciniæ* 3 exteriores oblongo-lanceolatæ, valde obtusæ, glabræ, striatæ, intense carneæ; 3 interiores subæque longæ, lato-spathulatæ, retusæ, flavo-virescentis, maculis viridis pictæ.

HAB. Huaylluay, near Pasco; at an elevation of from 12,000 to 14,000 feet above the level of the sea.

This species so nearly accords with the *A. glaucescens*, Humb. and Kunth, that both Mr. Cruckshanks and myself doubted at first if it ought not to be considered identical with it: but the form of the inner segments of the *perianth* is so very different, that we have thought it safer to describe it as a distinct species, to which we have given the name of *A. dulcis*, on account of the sweet pulp, with which the seeds are surrounded, and which are eaten by the native children of the elevated regions which it inhabits.

TAB. XCV. *Fig.* 1, Outer segment of the perianth. *Fig.* 2, Inner do:—slightly *magnified*.

II. COMMELINEÆ. *Mirb.*

1. Commelina *gracilis*. *Ruiz et Pav. Fl. Per. v.* 1. *p.* 44. *t.* 72. *Hook. in Bot. Mag. t.* 3047.—C. formosa. *Graham in Ed. N. Phil. Journ.* 1830.

HAB. Ditches about Lima.

III. GRAMINEÆ. *Juss.*

1. Megastachya *thalassica*. *Roem. et Sch. Syst. Veget. v.* 2. *p.* 590.—Poa thalassica. *Humb. et Kunth, Nov. Gen. v.* 1. *p.* 127.

Hab. By the sea-side, Lurin, near Lima.

The *leaves* of this plant, in the dried state, are mostly involute at their margin.

III. ACOTYLEDONES.

I. FILICES. *Juss.*

1. Lycopodium *crassum;* caule procumbente radicante, ramis

erectis cylindraceis crassis simplicibus vel dichotome divisis, foliis multifariam imbricatis erectis subspiraliter inclinatis lineari-lanceolatis acuminatis rigidis compressis obscure crenulatis, capsulis axillaribus solitariis. *Humb. et Kunth, Nov. Gen. v.* 1. *p.* 33. *Hook. et Grev. in Ic. Fil. ined.*

2. Acrostichum *squamosum;* frondibus simplicibus lanceolato-linearibus obtusis basi attenuatis, utrinque stipiteque squamis ciliatis (non raro deciduis) dense obsitis. "*Cav. Præl.* 1801. *n.* 580." *Sw. Syn. Fil. p.* 10. *Humb. et Kunth, Nov. Gen. v.* 1. *p.* 1.—A. lepidotum. *Willd.*—A. plicatum. *Cav.*

Hab. Huaylluay, near Paşco.

3. Polypodium *stipitatum;* caudice repente squamoso, stipite elongato patenti-hirto, fronde lineari acuminata profunde pinnatifida fere pinnata subtus rachi venisque hirtis, laciniis ovatis obtusis integerrimis inferne decurrentibus 1–4-soris. *Hook. et Grev. in Ic. Fil. ined.*

Hab. Huaylluay, near Pasco.

4. Polypodium *gracile;* glabrum, caudice brevi repente squamoso, frondibus linearibus pinnatis, pinnis lineari-oblongis sinuato-pinnatifidis, soris demum confluentibus, stipite rachique gracillimis. *Hook. et Grev. in Ic. Fil. ined.*

Hab. Huaylluay, near Pasco.

5. Polypodium *fulvescens;* caudice repente ferrugineo-tomentoso, fronde lanceolata pinnata, pinnis horizontalibus seu deflexis lineari-oblongis pinnatifidis inferioribus bipinnatifidis segmentis rotundatis obtusis, subtus rachi stipiteque pilis numerosis ferrugineo-fulvis obsitis. *Hook. et Grev. in Ic. Fil. ined.*

Hab. Huaylluay, near Pasco.

6. Polypodium *rigidum;* fronde stricta lanceolata bipinnata, pinnulis ovato-rotundatis acutis subpetiolatis, marginibus reflexis denticulatis rigidis, subtus stipite rachique paleaceis. *Hook. et Grev. Ic. Fil. f.* 163.

Hab. Huaylluay, near Pasco.

7. Nephrodium *trapezoides?* frondibus lanceolatis bipinnatis, pinnulis petiolatis rhombeis obtusis inciso-lobatis, lobis mucronato-serratis, stipite rachibusque dense paleaceis, soris costæ approximatis demum confluentibus. *Presl, in Reliq. Hænk. v.* 1. *p.* 37. *t.* 6. *f.* 1.?

Hab. Huaylluay, near Pasco.

The plant figured and described in the Reliquiæ Hænkianæ is from the mountains of Peru. The description sufficiently accords with our plant, and the representation of its pinna at *f. b:* but the pinnæ and pinnules in the figure of the natural size are not so compact as in these specimens; and the Fern itself, belonging to the same tribe as our *Nephr. aculeatum* and *lobatum*, is equally difficult to characterise.

8. Cistopteris *fumarioides;* frondibus ovato-oblongis flaccidis glaberrimis bipinnatis, pinnulis petiolatis ovatis obtusis (acutisve) pinnatifidis, laciniis cuneato-oblongis obovatisque apice bi-tridentatis, rachibus alatis, soro in qualabet lacinia solitario subrotundo. *Presl, in Reliq. Hænk. v.* 1. *p.* 39. *t.* 6. *f.* 2.—β. pinnulis angustioribus. *Presl.*

Hab. β. Sullimarca, near Pasco.

Of the two specimens I possess of this plant, one has the pinnules obtuse, as described by Presl; the other acute. Both are so similar to the *Cistopteris fragilis* of our country, that I scarcely know how they can be distinguished from it.

9. Asplenium *triphyllum;* frondibus linearibus bipinnatis, pinnulis ternatis cuneatis apice bidentatis, media petiolata, soris subsolitariis, rachi discolore. *Presl, in Reliq. Hænk. v.* 1. *p.* 45.

Hab. Culluay, near Pasco, in the Valley of Canta.

II. LICHENES. *Ach.*

1. Borrera *leucomela. Ach. Lich. Univ. p.* 499. *Syn. Meth. Lich. p.* 222.—Lichen leucomelas. *Linn.—Swartz, Obs. Bot. t.* 11. *f.* 3.

Hab. Valley of Lima.

2. Borrera *ephebea;* thallo cinereo-pubescente, laciniis erectiusculis complicatisque subteretibus ramosis filiformi-attenuatis subtus subcanaliculatis concoloribus, apotheciis sparsis disco nigro, margine thallode subinflexo pubescenti-ciliato. *Ach. Lich. Univ. p.* 501. *Syn. Meth. Lich. p.* 223.

HAB. Valley of Lima.

3. Roccella *fuciformis;* thallo plano cinereo-virescente dichotome laciniato, laciniis attenuatis, apotheciis marginalibus. *Ach. Lich. Univ. p.* 440. *Syn. Meth. Lich. p.* 244.—Lichen fuciformis. *Linn.—Engl. Bot. p.* 728.

HAB. Rocks on the sea-shore, about Lima; abundant.

This *Archil* has been chemically analyzed by Mr. Mackintosh, and found to yield a very inferior dye, so as scarcely to be worth gathering as an article of commerce. The true *R. tinctoria,* (if it be indeed a distinct species,) with terete fronds, probably grows on the same rocks with it; as I have seen them both in the Scilly Isles: and is, I believe, always found to yield a more beautiful and valuable colouring matter.

ALGÆ. *Linn.*

1. Sargassum *vulgare. Ag.*—Fucus natans. *Auct.*

HAB. The Pacific Ocean.

LEDEBOUR'S JOURNEY TO THE ALTAIC MOUNTAINS.

IN the Second Part of Vol. I. of this Miscellany, I announced the intended publication of the result of Professor Ledebour's visit to the Altaic Range of Mountains. Considerable progress has now been made in this work. The first volume of the beautiful *Icones Plantarum* has appeared; the first, also, of the *Flora Altaica,* and two volumes of *Travels.* The latter abound in interesting matter: they give an excellent picture of the country and its inhabitants, detail the diffi-

culties the traveller experienced from the nature of the climate and of the roads, or rather the want of roads, and what is more to our purpose, they contain most important Botanical information. My readers will receive with pleasure Ledebour's account of the geographical distribution of vegetables in the regions he visited, and the preface likewise includes some general remarks, which cannot fail to prove interesting.

Our author, a German, I believe, by birth, had, from his earliest youth, entertained the strongest desire to visit the interior of the Russian dominions. In 1810, he became acquainted with the celebrated Pallas, who encouraged him in these wishes, and furthered his views to the utmost of his power. Still it was not till 1818, that the Counsellor of State, Ledebour, made a journey through the Taurian Peninsula; but more with the hope of establishing his health than for the purposes of scientific information.

Up to this period, very little, comparatively, was known of Asiatic Russia; and for what concerns its Natural History, we are indebted solely to the early travels of the Academicians. At those times, notwithstanding the most liberal assistance afforded by Government, they encountered many difficulties; in a great measure owing to the then unsettled state of the countries, which rendered some districts inaccessible, and compelled travellers to confine themselves to the post roads. This was eminently the case with the Altaic chain of mountains, and the country situated to the south-west of it—the Soongarien Kirgisen Steppe, which extends to the northern boundary of the Chinese provinces, and which is interrupted, to the west, by lofty ridges. The elder Gmelin travelled along the foot of the Altaic Mountains, as did Falk. Pallas went as far as Tigerâk, without, however, visiting the lofty mountains. Sievers only explored the frontiers. Patrin also went to Tigerâk. Nothing is known of Laxmann's expedition. Schangin is the first man of science who reached the lofty range of the Altai; but he seems to have gone exclusively in the character of a mineralogist. Salessow travelled thither: he was a physician,

and sent some few plants, collected on the Tschuja, to Stephens at Moscow. More recently, the Counsellor of State, Gebler of Barnaul, dispatched a person to collect seeds and plants there: still the region might be considered, to the Naturalist, as a *terra incognita;* and on that account Professor Ledebour was particularly anxious to direct his attention to it, and to explore, as a Botanist, the southern and western sides. Such, however, was the nature of Ledebour's duties at Dorpat, that he could not be absent more than a year from the University. He reckoned that he could perform the journey to Barnaul, in the Government of Kolivan, in one winter, and return in the following; and, in order to facilitate his design, Dr. Meyer and Dr. Bunge were associated with him, and 10,000 rubles were allotted from the funds of the University, to defray the travelling expenses.

Ledebour set out in January, 1826, from Dorpat, and returned in February, 1827. He reflects with pleasure on the various events of the journey; yet, in bringing his *Travels* before the public, he warns the reader not to expect too much from them. "The inexhaustible interest," he says, "excited by the perusal of travels through the north of Africa or south-west of Asia, where numerous monuments of times long past continually arrest the attention, are here wholly wanting. Equally destitute are the countries we have visited of those features, whether of the animal or vegetable world, which throw such a charm over the description of tropical climates, and render them captivating to every one who possesses a cultivated mind and taste. Here nature, with few exceptions, only exhibits the general forms of the north of Europe: and when the Naturalist discovers what is new and peculiar to these regions, it cannot be said to possess any very attractive characteristics: it neither gratifies by its beauty, nor surprises by its singularity of structure. The Altaic Mountains, on account of their northern and eastern position, stand, in respect of climate, in such an unfavourable contrast with the mountainous regions of the south, that, even from this circumstance alone, the district is beheld

in a very unattractive point of view. The traveller does not here, as in more genial latitudes, descend from lofty mountains into *smiling fertile vales*, where a bright sky makes him forget all his fatigues; on the contrary, he must submit to be drenched with continually recurring rains, to experience frost even in the nights of summer, and to wade through bogs, which accompany him for days together, with little or no interruption. The greatest attention on our part has been requisite, from the nature of the country, for the preservation of the collections. Deep and rapid rivers had to be forded with baggage, for many days in succession; whilst the frequent rains, and the low state of the atmosphere, presented, at times, almost insurmountable difficulties. At night, when we attempted to secure our collections in our tent, the wet state of the ground on which they were piled, and the heavy showers without, occasioned them to contract so much moisture, that it required no little precaution to keep them from spoiling. The only remedy we had, was to shift the plants frequently into papers dried by the camp fire." This, it must be acknowledged, was a very tedious though a necessary operation, and it was rendered the more toilsome from the limited quantity of paper they took with them for such large collections. All had to be conveyed on pack-horses, and all had to be so carried through the whole journey, there being no convenient depôt where any portion of them could be left in security. Nevertheless, all safely reached Dorpat: forty-two chests of living plants and seeds were obtained; and, with few exceptions, they have all succeeded. The Herbarium, contained 1600 species, (excluding the few *Cryptogamiæ*,) and of these, almost one-fourth are new species. The Botanic Garden obtained 1300 species, of which 500 had hitherto never been cultivated; and the duplicates have been generously distributed. Zoology was not neglected. 21 species of *Mammalia*, 64 *Birds*, 23 *Amphibiæ*, and 550 species of *Insects* are deposited in the museum, the result of their journey: among the former of these may be mentioned the *Steinbock Antelope*, many

specimens of the ***Musk Animal***, and the skulls and horns of the *Argali*, and other animals. Of minerals, there were 400 species.

From the first volume of these "Travels," we extract the following

GENERAL OBSERVATIONS
ON
THE FLORA OF THE ALTAIC MOUNTAINS,
AND THE NEIGHBOURING STEPPES.

The southern and western part of the country, which it was the object of the present journey to examine, consists of wide steppes, whose soil is partly sand and partly clay, containing more or less of saline principle. It is watered by the Irtysch River, which, above Buchtarminks, changes its northern direction from the mouth of the Narym, to west-north-west, and continues thus to Ustkamenogorsk, then runs nearly north-west till below Semipalatinsk; but from thence, constantly resumes its northerly course. Besides this, the Alei must rank as a principal river in that part of the steppe, situated to the north of the Irtysch; while the Uba, on the contrary, has only a short course through it, and the Ulba, rising out of a mountain, pursues its way along the foot of it to the Irtysch, into which it empties itself near Ustkamenogorsk.

In the north-western part of this steppe, many lakes are seen, some of which are very strongly impregnated with salt, and none perhaps are quite destitute of it. Farther south, particularly in the eastern part of this steppe, situated near the mountain north of the Irtysch, and through the whole district south of this river, the ground rises, partly into separate hills, and partly into ranges of little eminences. These extend from Barnaul to the village of Sauscka, situated at the foot of the mountain, rising in the form of terraces, from 360 to 1,156 Parisian feet in height. Large Pine forests stretch from Barnaul, close by Loktewsk, to the outpost of Schulbinsk, on the Irtysch; the banks of the

Alei are also covered with trees, exclusive of the *Fir* tribes, and the same is probably the case with the other small rivers. The Uba and Ulba, however, where they have their course beyond the mountain, are, so far as I have seen, unadorned with wood; and, in general, the greater portion of this wide steppe tract, with the exception of the above-mentioned *Pine* forest, that extends almost uninterruptedly from Barnaul to Schulbinsk, is entirely barren of trees; but farther north, there is no deficiency of them. In these steppes occur many plants that grow plentifully in Europe, particularly the following;—*Adonis vernalis* and *Anemone patens*, both in great abundance; many species of *Artemisia*, *Allium*, *Gypsophila*, and *Statice*, numerous *Umbellatæ*; *Ceratocarpus arenarius* and *Diotis ceratoides* cover whole tracts; and where the ground is impregnated with saline principle, the peculiar salt-plants occur in abundance, such as the species of *Polycnemum*, *Atriplex*, *Chenopodium*, *Frankenia*, *Tamarix*, *Salicornia*, and *Halocnemum*; also *Chorispora sibirica*, *Diotis atriplicoides* and others. Farther to the south, *Amaryllis tatarica* is extremely plentiful, with *Rindera tetraspis*, and the equally rare *Nepeta sibirica*; and the beautiful *Eremurus* growing on the little hills. But the peculiar richness of the Flora of this steppe first displays itself in the neighbourhood of the Irtysch, and on its left bank, especially in the tract of the *Noor Saisan*, where, besides most of the above-named plants, the following deserve to be particularly noted:—a new species of *Peplis*, and of *Camphorosma*; many individuals, quite peculiar to this country, belonging to the genera *Cachrys*, *Peucedanum* and *Seseli*; among the *Asperifoliæ*, the genera *Echinospermum* and *Lithospermum*, *Cynoglossum viridiflorum*, *Solenanthus circinnatus* (n. sp.), *Tounefortia Arguzia*, *Hyoscyamus pusillus*, *Rheum leucorhizum*, *Arenaria tubulata*, *A. filifolia* and *longifolia*, *Cotyledon Lievenii* (n. sp.), *Saponaria elegans* (n. sp.), many *Zygophylla*, *Ammodendron Sieversii*, *Calligonum Pallasii*, the *Saxaul* (*Anabasis Ammodendron*, n. sp.), *Rosa berberifolia*, *Ranunculus platyspermus*, *Dodartia orientalis*, *Dracocephalum integrifolium* (n. sp.), two new kinds of *Eremostachys*, (a genus that ranks between *Phlomis* and *Molucella*,) *Phlomis agraria*,

several *Alyssa, Chorispora stricta, Goldbachia,* many *Lepidia, Megacarpæa laciniata, Sterigma tomentosum, Tauscheria;* a host of *Astragali,* several of them frutescent, *Hedysarum splendens, Robinia Halodendron, Cirsium igniarium,* and a variety of *Saussureæ, Serratulæ* and *Scorzoneræ,* with *Tragopogon ruber,* and many others. Nevertheless, many of these plants occur also even in the territory of Loktewsk. If you ascend from these steppes to the mountain, the vegetation assumes, when at an elevation of 4,500 Parisian feet, a greater similarity to that of Europe than it presents in the steppe itself; although many of the peculiar productions of this country may be seen here too. The latter principally belong to the vernal plants; they also grow on the steep sides of the rocks, or adorn the banks of the wild mountain-streams, wherever these are subject to occasional inundations. It is in such spots that *Gentiana acaulis* and *Cortusa Matthioli* flourish, where *Cardamine macrophylla, Saxifraga Geum,* Pedicularis resupinata* and others, grow in the greatest luxuriance. Also, rich flat meadows, situated at the foot of the higher mountains, or stretching between them, produce many of the peculiar plants of Siberia; while, on the contrary, gently rising hills, or spots clothed with scattered woods, exhibit such vegetation only as is common to Europe. This is likewise observable in such places as form standing bogs, and are neither irrigated by the fresh water trickling down the mountains, nor shaded by a thick covering of foliage. Still the morasses of this region do possess some plants peculiar to themselves.

The Spring Flora is peculiarly marked by the abundance of its *Ranunculaceæ* and *Liliaceæ, Ranunculus polyrhizos, Adonis vernalis, sibirica,* and *villosa, Pæonia hybrida, Anemone patens, cærulea, altaica,* and *umbrosa* (n. sp.), *Atragene alpina, Ornithogalum angulosum* (n. sp.), and *uniflorum, Tulipa altaica* and *tricolor, Iris ruthenica, glaucescens* (n. sp.), and *flavissima.* Among the rock-plants of this region, may particularly be noticed the following, as being most numerous; although some are not generally diffused, but abound in individual tracts—(the latter are indicated by *.) *Veronica pinnata, Ziziphora media, Dracocephalum origanoides*, peregrinum,*

*pinnatum**, *Ruyschianum* and *nutans*, *Nepeta lavandulacea*, *Thymus angustifolius*, *Patrinia sibirica*, *Androsace dasyphylla** (n. sp.), *Myosotis rupestris*, *Onosma simplicissima*, and *Gmelini**, *Sibbaldia erecta* and *altaica*, *Statice speciosa*, *Swertia dichotoma*, *Thesium rupestre** (n. sp.), *Bupleurum baldense*, several *Allia*, *Stellera altaica**, *Gypsophila thesiifolia*, *Orostachys chlorantha*, *Sedum Eversii**, and *hybridum*, *Silene altaica**, *graminifolia*, *stylosa* (n. sp.), *Potentilla pensylvanica*, *sericea*, and other individuals of this genus: *Thalictrum petaloideum*, *Linaria altaica*, several *Alyssa*, *Erysimum lanceolatum*, *Hesperis aprica**, various *Astragali*, *Oxytropis setosa*, *Aster alpinus*, *Centaurea sibirica*, *Prenanthes diversifolia* (n. sp.), and *Ephedra monastachya.* On the above-mentioned meadow-plain, grew to the height of a man, some *Heraclea*, *Seseli athamanthoides*, *Cirsium heterophyllum*, *Silybum cernuum*, *Achillea impatiens*, several *Adenophora*, *Delphinia*, and *Aconita*, many *Veratra* and *Thalictra*, with *Senecillis glauca*, *Tragopogon orientalis*, *Pedicularis elata*, and the beautiful *P. proboscidea*, that covers large tracts.

Among the peculiar bog-plants of this region, I mention *Androsace filiformis*, *Viola* (*tricoloris*, *aff.*), *Ranunculus Cymbalaria*, *longicaulis* (n. sp.), *natans* (n. sp.), *Gentiana barbata*, *Cirsium Gmelini*, *Potentilla multifida*, *Allium uliginosum* (n. sp.); and where the ground is shaded by shrubs or low copsewood, we find *Primula sibirica*, *Phaca exaltata*, *Pedicularis speciosa*, and others. Where the vallies expand, in consequence of the rivers that water them being swollen by the junction of other streams, as the valley of Tscharysch, in the district where it receives the Kerlyk, and the vale of the Koksun, at the confluence of the northern Abai; there, between the river and the mountain that bounds the vale, are extended flat, steppe-like plains, similar to those found at the foot of the mountains, but with less luxuriance of vegetation, and different from them in their peculiar productions. In such spots grow *Convolvulus Ammani*, *Gentiana Gebleri*, *Potentilla* (n. sp. *subacauli*, *aff.*) *Saussurea* (n. sp.), *Peucedanum vaginatum* (n. sp.), which, in dry places, is only a few inches high, *Aster altaicus*, *Veronica incana*, *Alyssum*

tenuifolium, several *Artemisiæ*, with *Ranunculus amœnus* (n. sp.), *Sisymbrium micranthum* (n. sp.), *Ballota lanata*, several kinds of *Leontodon*, and, according as the soil is more or less salt, *Glaux maritima*, which frequently densely covers the ground, and the other formerly-enumerated saline plants.

From 4,500 to an elevation of 6,500 Parisian feet, where *Pinus Cembra* marks the highest present boundary of the growth of trees, the Europæan species gradually diminish to give place to the Flora of the Altai. Here grow most of the individuals of the genus *Pedicularis*, *Sanguisorba alpina* (n. sp.), *Primula nivalis*, *Veronica densiflora* (n. sp.), *Gentiana altaica*, *angulosa*, *glacialis*, *humilis* and *septemfida*, *Swertia obtusa* (n. sp.), *Athamanta compacta* (n. sp.), *Linum sibiricum*, *Lonicera hispida*, *Primula Pallasii*, *Viola altaica*, *uniflora* and *pinnata*, *Juncus triglumis*, *Epilobium alpinum*, *Cerastium alpinum*, *Saxifraga Hirculus*, *Mespilus uniflora* (n. sp.), *Potentilla macrantha* (n. sp.), *Aquilegia glandulosa*, *Ranunculus altaicus*, *Anemone narcissiflora*, *Dracocephalum altaiense*, *Linnæa borealis*, *Phlomis alpina*, *Cochlearia integrifolia*, *Macropodium nivale*, *Oxytropis altaica*, *sulphurea* (n. sp.), *Doronicum altaicum*, *Erigeron alpinus*, *Frolovia lyrata* (n. sp.), *Leuzea altaica*, *Saussurea pycnocephala* (n. sp.), a number of *Willows*, &c. The most central of these extended steppes, near the Tschuja, which rise one above another like terraces, and the highest of those which Bunge visited, situated towards the western or lower end, at an elevation of 5,759 Parisian feet, is still more distinguished by its vegetation than those of inferior elevation, situated on the banks of the Tscharysch and Koksun, being extremely arid, though sparingly producing, here and there, individual groupes of plants, and exhibiting such only as are entirely peculiar to itself. Two species of *Anabasis*, a new and shrub-like *Atriplex*, likewise an undescribed frutescent *Chenopodium*, and three new *Zygophylla*, a couple of novel, shrub-like, and very strongly scented *Artemisiæ*; *Corydalis stricta* in large bushes; some species of *Oxytropis*, with persistent prickly peduncles, some with verticillate leaflets, forming low shrubs; these, together with a few other plants, form the whole of the certainly poor, but highly

interesting Flora of this steppe. Yet, at some hundred feet above the present boundary of the growth of trees, are seen their dead stems, and, on the ground, many prostrate shrubs, such as *Juniperus nana*, (?) *Betula nana*, several *Willows*, *Mespilus uniflora*, and *Dryas octopetala*. Many of the herbaceous plants of the preceding region occur also in this: but among those entirely confined to it are the following:—*Eriophorum Chamissonis* (n. sp.), *Athamanta crinita* (n. sp.), *Claytonia acutifolia*, *Gentiana algida*, *nutans* and *rotata*, *Sibbaldia procumbens*, *Luzula spicata*, *Oxyria reniformis*, *Arenaria* (*Helmio*, *aff.*), *nardifolia* and another new species, *Biebersteinia odora*, *Cerastium pauciflorum?* *Lychnis uniflora* and *tristis* (n. sp.), *Saxifraga cernua*, *glandulosa* (n. sp.), *terektensis* (n. sp.), and *hieraciifolia*, *Sedum elongatum* (n. sp.), and *quadrifidum*, *Thermopsis alpina*, *Potentilla grandiflora* and *nivea*, *Papaver nudicaule*, *Ranunculus isopyroides*, *Thalictrum alpinum*, *Gymnandra bicolor* (n. sp.), several species of *Pedicularis*, *Draba carnosula* (n. sp.), *hydrophila* (n. sp.), and *lactea*; *Parrya exscapa* (n. sp.), *Corydalis pauciflora*, *Phaca frigida*, *Trifolium grandiflorum* (n. sp.), *Artemisia alpina*, *Cineraria* (*aurantiacæ*, *aff.*), and *lyrata* (n. sp.), *Hieracium crocatum* (n. sp.), some kinds of *Leontodon*, *Pyrethrum pulchrum* (n. sp.), *Saussurea pygmæa*, *Orchis viridis*, and various *Grasses* and *Sedges*. Some plants also grow in this district that are found at every elevation throughout the country. *Caltha palustris* generally adorns the margin of little alpine rivulets; *Epilobium angustifolium* also is found in spots above the boundary of trees, quite unaltered in its appearance; *Erythronium Dens Canis* springs up wherever the snow is just melted.

The highest limit of trees, which I have estimated at 6,500 Parisian feet, is not, however, always the same. It depends partly on the species of tree, partly on the aspect of the declivity of the mountain. On the southern side of the mountain, at the rise of the Tscharysch, I found the last stem of *Pinus Cembra* at an elevation of 6,541 feet above the sea. When I ascended the north side of the Plateau des Korgon, I found the highest limit of the same

tree at a height of 5,254 feet: and on the Koksunchen Snow Mountains (their east and western sides) at 5,692 feet. On the Snowy Mountains of Ulbinski to the Kreuzberge at Riddersk, where the *Larch* forms the boundary, these trees now cease at 5,500 Parisian feet, whilst their dry stems may be seen at a height of 6,187 feet. As to the grouping of the different kinds of trees, the following remarks suggested themselves to my observation. *Birch, Firs,* and *Pines* are in the lower situations. The *Birch* (*Betula alba*) rises no higher than 4,536 feet on the Ridderschen Kreuzberge: on the east side of the Koksun Snow Mountains it ascends to an elevation of 5,236 Parisian feet. *Pines,* which are seen on the sandy soil of the steppes, and are also common on the granite rocks among the mountains, seldom appear higher than 3,000 Parisian feet above the sea. *Firs,* on the contrary, which I have not observed on the steppe between Barnaul and Schlangenberg, though very frequently while journeying westward from Barnaul, forming forests with *Pine-trees,* and which are very common likewise on the mountains, ascend to an elevation of 5,272 Parisian feet; although at 4,000 feet they become more rare. *Pinus sibirica* grows with the two latter trees at the foot of the mountains, but still oftener along with *P. Abies;* and at a height of 2,000 to 2,300 feet, it is very abundant. From 4,000 feet upwards, this species occurs in greater numbers as *P. Abies* disappears: and at 4,000 to 5,000 feet it forms large and close forests. I have never observed it beyond 5,272 feet; its limit being the same as that of the *Fir.* I do not recollect having met with *Larch trees* below an elevation of 2,550 feet. Their highest boundary is on the Ridder Kreuzberge, 5,500 Parisian feet; at 4,000 feet they begin to form extensive woods, everywhere covering the north side of the mountains; as, for instance, the Cholsun, the Listwäga, and several others. *Pinus Cembra* first occurs at 4,000 feet; but it is never so numerous as to cover a tract of country to the comparative exclusion of other trees. I have only heard of a forest of *Cedars* at Tschetschulicha, never having seen it myself, which was stated to attain a greater elevation than any other tree here, even 6,541 Parisian feet.

When these woods are very thick, particularly of *Pinus sibirica*, (I have not observed such to the north of Talowkaja-Sopka, at Riddersk,) they will scarcely allow a plant to grow: when they are not so close, and the ground is moist, they then shelter an uncommonly luxuriant vegetation: *Aconita*, *Cimicifuga fœtida*, *Senecio sarracenicus*, *Cacalia hastata*, *Polemonium cæruleum*, *Orobus luteus*, *Pæonia hybrida*, *Arabis pendula*, and several others, frequently attain a considerable height, 8 or 10 feet, and even more; but where the woods are very thin, and the ground is dry, there the covering of plants is extremely scanty. As to the line of snow, I can scarcely, from the observation of a single year, say any thing with certainty. On the north side of the mountain, at Riddersk, I have seen snow in the hollows at the height of 5,500 feet during the whole summer. I cannot assert, from my own knowledge, that this is annually the case; though, in answer to my inquiries, I have been informed that it is so; the quantity of undissolved snow, however, varying in different years. On the Plateau of the Korgon, I observed, on the side which inclines to the northward, at 6,700 feet, large masses of snow, in which might be clearly distinguished the layers of several years: such a circumstance never came under my notice on the southern declivities of any mountain. For, whether the summit of the Alp of Baschalatki, which, when I saw it on the 26th of July, was at some distance from my camp, is always covered with snow during summer, I do not know. The countrymen declare that such is the fact; but it is extremely difficult to obtain correct information on similar points from them. To what altitude the culture of corn might be successfully prosecuted, has not been ascertained by actual trials; yet it deserves to be noticed, on this subject, that I have seen, between the villages Belaja and Tokalka, situated to the south of Cholsun, corn growing at about 4,000 feet above the level of the sea, which is also the limit of resident inhabitants, (in the village of Fykalka.) Some Kalmucks, perhaps, who rove in the lofty Tschuja-steppe, may pass the winter at a still greater height; still their *Jurten* cannot be termed settled habitations:

nor do I know, indeed, positively, where these wandering tribes do spend that season, as I have not visited those regions myself. When the geographical position of the countries which we explored, is carefully considered, lying from 47° to 54° north latitude, and at their northern boundary, from 99° to 105°, but on the south from 91° 30′ to 102° 30′ east longitude, from Faro, no other prevailing forms of vegetation can really be expected, than such as have a general similarity to those of the northern and midland parts of Europe: for it is well known, whatever be the longitude, that corresponding degrees of latitude produce the same kind of vegetation, becoming more and more alike as they proceed from the equator towards the Poles. But we may reasonably conclude that many species, different from the Europæan, occur in a country which is divided from Europe by a large chain of mountains, the Ural, running north and south, by immensely extended steppes, lying at the south and eastern foot of these, and which are even traversed by mountains whose elevated summits rise above the level of the snowy region. It will not, therefore, be uninteresting to compare the Flora of these districts with that of an Europæan country, occupying a nearly similar geographical position. Let this be Germany; which, situated under the same latitude, of nearly equal superficial extent; containing, likewise, towards the south-east, the highest mass of mountains, and watered by considerable rivers, appears to be eminently adapted for comparison; although from its vicinity to the sea it presents a greater variety of physical situations. Germany has also been accurately investigated in a Botanical view. The same cannot be exactly said of the countries we have just visited; but so strong was the resemblance which we found to exist in the Flora of the different mountains, varied only by a change of soil; so uniform were the vegetable productions of the steppes, that although not, strictly speaking, entirely investigated, yet sufficient is known for the purposes of comparison. In the Altaic mountains, and adjoining steppes, we collected about from 1,600 to 1,700 *Phanerogamæ*. Germany, on the other hand, contains,

according to Bluff and Fingerhuth, 2,880* species. So that the German Flora to that of the Altai, bears the relation of about seven to four. The annexed Table exhibits the proportion between the different Families in the two Floras.

Name of the Families.	Number of known Species. Germany.	Altai.	Name of the Families.	Number of known Species. Germany.	Altai.
Naiades,	35	13	Convolvulaceæ,	8	8
Aroideæ,	6	1	Polemoniaceæ,	1	2
Typhaceæ,	7	3	Jasmineæ,	3	—
Cyperoideæ,	113	50	Gentianeæ,	41	24
Gramineæ,	195	103	Contortæ,	2	4
Junci,	42	17	Ericeæ,	26	9
Coniferæ,	14	9	Campanulaceæ,	45	11
Sarmentaceæ,	18	8	Lobeliaceæ,	1	—
Coronariæ,	58	34	Cynarocephalæ,	46	47
Irideæ,	17	7	Centaureæ,	16	8
Hydrocharideæ,	9	5	Eupatorinæ,	52	47
Nymphæaceæ,	4	3	Perdiceæ,	1	2
Orchideæ,	54	13	Radiatæ,	113	56
Aristolochiæ,	3	—	Cichoreæ,	133	51
Polygoneæ,	34	32	Aggregatæ,	18	2
Chenopodeæ,	43	60	Valerianæ,	19	6
Amarantheæ,	6	2	Cucurbitaceæ,	2	—
Santaleæ,	5	4	Rubiaceæ,	33	12
Thymeleæ,	8	5	Caprifoliaceæ,	15	9
Amentaceæ,	104	54	Lorantheæ,	3	—
Urticeæ,	10	7	Hederaceæ,	1	—
Euphorbiaceæ,	32	16	Umbelliferæ,	114	62
Plantagineæ,	10	8	Saxifrageæ,	28	10
Plumbagineæ,	3	7	Terebinthaceæ,	4	—
Primulaceæ,	42	17	Rhamneæ,	13	2
Lentibulariæ,	5	3	Berberideæ,	2	2
Personatæ,	100	62	Rutaceæ,	2	8
Verbenaceæ,	1	—	Acereæ,	6	—
Labiatæ,	126	59	Onagrariæ,	19	8
Asperifoliæ,	53	36	Tamariscineæ,	1	5
Solaneæ,	37	8	Salicariæ,	5	3

* Vid. *Flora German.* vol. 1 and 2. Nuremberg, 1825.—I have taken this publication as the ground-work of my comparisons, because it is the latest Flora of Germany which includes all classes of the Vegetable Kingdom, (excepting the *Cryptogamia.*)

Name of the Families.	Number of known Species. Germany.	Altai.	Name of the Families.	Number of known Species. Germany.	Altai.
Cruciferæ,	156	103	Cisti,	10	—
Fumariæ,	10	7	Ionideæ,	24	15
Papaveraceæ,	11	4	Frankeniaceæ,	—	2
Ranunculaceæ,	96	71	Caryophylleæ,	110	78
Polygaleæ,	10	2	Lineæ,	13	6
Leguminosæ,	156	130	Portulaceæ,	3	1
Capparideæ,	5	—	Grossulariæ,	7	6
Droseraceæ,	4	1	Myrtaceæ,	2	—
Balsamineæ,	1	2	Sedeæ,	31	11
Geraniaceæ,	19	13	Rosaceæ,	192	74
Oxalideæ,	3	1	Reaumuriaceæ,	—	1
Malvaceæ,	15	4	Incertæ Sedis,	2	1
Tiliaceæ,	4	—			

It appears, from this comparison, that the families are by no means of the same nature in both countries. In Germany, thirteen families occur, wanting in Altai; *viz.*—the *Aristolochiæ*, *Verbenaceæ*, *Jasmineæ*, *Lobeliaceæ*, *Cucurbitaceæ*, *Lorantheæ*, *Hederaceæ*, *Terebinthaceæ*, *Acereæ*, *Capparideæ*, *Tiliaceæ*, *Cisti*, and *Myrtaceæ*. These, together, contain forty-five species, and, therefore, form only 1-64th part of the whole German Flora. On the contrary, two families occur in Altai, the *Frankeniaceæ* and *Reaumuriaceæ*, which, together, include three species wanting in Germany. Again, those families that are common to both countries, do not contain an equal proportional number of species in both. The *Cyperaceæ* amount in Germany to 1-22d of the whole Flora, and in Altai to 1-32d. The *Grasses* in Germany, which are almost 1-15th, are in Altai 1-16th; the *Amentaceæ* 1-28th in Germany, and in Altai 1-30th; the *Personatæ* in Germany 1-29th, in Altai 1-26th; the *Labiatæ* in Germany 1-23d, in Altai 1-27th; the *Aroideæ*, *Junceæ*, *Sarmentaceæ*, *Irideæ*, and *Orchideæ*, form altogether in Germany, 1-21st, and in Altai only 1-35th part of the whole Flora. Germany, on the contrary, contains only two *Polygona* more than the Altai. This family amounts there to 1-85th, here to 1-50th; and, in respect to the *Chenopodia*, the German Flora stands so far behind, that this family in Germany only numbers 1-67th, but in Altai 1-27th. Also in *Plantagineæ*, *Plumbagineæ*, and *Convolvuli*, Germany is poorer than the Altai;

these families forming, in the latter, 1-64th of the whole vegetable productions, and in Germany, 1-137th; the former, again, falls far behind in the number of its *Primulaceæ*, *Solaneæ*, *Ericeæ* and *Campanulaceæ*; these, collectively, being in Germany 1-19th, and in Altai only 1-37th. The *Compositæ*, in the mass, form in both countries about 1-8th; but the separate families of this Natural Order are very differently distributed. While in Germany, the amount of *Centaureæ*, *Radiatæ*, and *Cichoraceæ* preponderates, the Altai is richest in *Eupatoriæ*, *Perdicieæ*, and particularly *Cinarocephalæ*, the latter section indeed being more numerous than in Germany. The *Aggregatæ*, *Valerianeæ*, *Rubiaceæ*, *Saxifrageæ* and *Rhamneæ*, compose in Germany 1-26th, in the Altai 1-50th. The *Rutaceæ* and *Tamariscineæ*, on the contrary, amount to 1-123d in the latter, and in Germany to only 1-960th. The *Umbellatæ* are, in the latter, 1-25th, in the Altai 1-26th: the *Cruciferæ* of Germany 1-12th, of Altai 1-18th. In *Malvaceæ*, *Lineæ*, *Portulaceæ*, and *Sedeæ*, the German Flora excels, as, in respect to the *Ionideæ* and *Grossulariæ*, it must yield to the Altai. The *Caryophylleæ* constitute in Germany 1-26th, in the Altai 1-20th; and, lastly, the *Rosaceæ* of Germany are 1-15th, and of the Altai 1-21st: still many of the numerous *Rubi*, now entering into the German Flora, might probably, on examination, appear to be natives of the Altai also.

A striking feature of Altaic vegetation consists in the great scarcity of hard-wood trees. We have seen, by the above list, that the *Terebinthaceæ*, *Acereæ* and *Tiliaceæ* are wanting to its Flora; so are also the genera *Quercus*, *Fagus*, *Carpinus*, *Fraxinus*, &c. The *Birch* is almost the only hard-wood found in tolerable plenty: next to it are the *Aspens*, which present themselves here and there, collected into little groves. Besides these, two other species of *Poplar* occur on the banks of rivers, and in the low tracts. The other hard-wood trees do not grow to a large size, and are scarcely numerous enough to deserve notice. With regard to the herbaceous plants, we may easily note the disproportion in the amount of annual and perennial ones. The former are very few, even in the less elevated districts; and as they

diminish on the mountains of other countries, so they here disappear almost entirely. In a country where the vegetation is often, during the flowering season, covered with snow, the annual plants cannot be expected to survive long, as their seeds are seldom perfected; while the perennial plants suffer less, their roots being unhurt, and capable of throwing up fresh shoots.

There still belongs another peculiarity to the Altaic Flora, which is, that in many of the families that are numerous here as to species, the genera are very few; whilst all the others seem to be replaced by an individual, or a couple of genera; thus it is among the *Personatæ*, where the genus *Pedicularis* composes almost 1-3d; and among the *Asperifoliæ*, where *Myosotis* and *Echinospermum* number more than one-half. In the *Cynarocephalæ*, too, upwards of half the species belong to *Saussurea* and *Serratula;* among the *Eupatorineæ*, the *Artemisiæ* are 2-3ds; and in the *Rutaceæ*, 3-4ths are claimed by the genus *Zygophyllum.* But the *Leguminosæ* present the most striking instance of this, for 3-4ths of the species in this very numerous family consist of the genera *Astragalus*, *Oxytropis* and *Phaca;* whilst the many genera which are found in other places, contributing numerous individuals to swell that tribe, are in Altai almost wholly wanting: for example, there are but two species of *Medicago*, and five of *Trifolium.* We collected twenty-three *Ferns*, according to the Linnæan system; of which 1-3d belong to *Equisetum.* From the abundance of other plants, we found it impossible to devote so much attention to the *Cryptogamiæ* as would have enabled us to institute a comparison between those of the Altai and of Germany; but we ascertained that, with regard to these plants, the difference is not material.

BIOGRAPHICAL NOTICE

OF THE LATE

CAPTAIN DUGALD CARMICHAEL, F. L. S.

By the Rev. Colin Smith, *Minister of Inverary.*

[*Continued from page 59 of the present Volume.*]

In the year 1807, Capt. Carmichael volunteered to accompany a detachment which was sent to Algoa Bay, a remote and then "little known outpost," to the south of the Cape; in order that he might have the opportunity of comparing its productions with those of the latter station. It was in this district that he turned his attention to Icthyology; and he has left drawings and descriptions of many fishes, found not only there, but in other parts of the coast of Africa and in Asia, which, after having carefully compared with those described by Shaw, and in other works which treated on that subject, he hesitated not to consider new. It has not, however, been deemed advisable to load the present memoir with the details of these, since many of them are now published in the more recent volumes of Zoological authors. It is but justice to remark, that these descriptions are drawn up with great care; and his anxiety to illustrate this obscure branch of Natural History, is well exemplified in the following passage from one of the pages in his journal.

"The bays of Southern Africa are well stocked with fish, many of which are of large size and excellent quality. Cape-town is abundantly supplied from Table Bay, by boats which go out early in the morning, and return before the hour of dinner. To pass some part of my idle time, I took sketches in pencil of all the species that are caught in that bay, and exposed for sale in the market. They appear to be almost entirely unknown to Naturalists, so far at least as I could judge from looking over Shaw's Icthyology, in which there are only three species of them described. I traced the outlines with

a Camera Lucida, and they may therefore be relied on as correct. For the satisfaction of such as might wish to know more of them than a figure could convey, I drew up concise descriptions, and attached to each a specific name, to which I added the local appellation, as far as I could ascertain it."

But we must accompany our Naturalist to Algoa Bay, respecting which place, and its people and productions, we shall make copious extracts from his Journal.

ALGOA BAY.

"On the 14th April, 1807, I embarked in the John, transport, for Algoa Bay. A detachment, consisting of one hundred men of the 72d and 93d regiments, under the command of Captain Lawrence, was ordered to relieve an equal force of the 83d regiment, stationed at that outpost. A desire to visit a spot so remote and so little known, induced me to become a volunteer on this occasion: and as none of those who possessed a prior claim had a taste for travelling, no objection was made. On weighing anchor, the morning of the 15th, we had an opportunity of witnessing the partial action of the south-east wind, which frequently occurs in Table Bay. While the John lay like a log on the calm unruffled surface of the water, another ship, which had stood out at a short distance from us, having caught the gale, shot across our bow at the rate of eight knots an hour. It soon, however, reached us also, and carried us speedily out of the Bay.

"Our progress to the eastward was retarded by baffling winds until the 24th, when a small breeze from the north-east sprung up, and, passing rapidly into a furious gale, obliged us to lie to for the space of twenty-four hours. It died away at length in repeated showers of rain. After a variety of delays, occasioned chiefly by our ignorance of the coast, we arrived at our destination on the 2d May, and landed the detachment on the 3d.

"Algoa Bay lies in the same parallel of latitude as Table Bay, the line of coast running from the latter with little variation due east. It is an immense excavation of the

Continent at its south-east angle, where it begins to take a northerly direction. It of course lies entirely open to the winds that set in from the south-east; though, it may be remarked in passing, that these winds are neither so frequent nor so violent as they are in Table Bay: on the contrary, the westerly winds prevail there throughout the year.

"The Bay is surrounded by a ridge of low sand-hills, or rather banks, clothed with a great variety of prickly shrubs; and the country behind spreads out in a level plain, terminating, at the distance of twelve or fifteen miles, in lofty mountains. From these mountains, a range of forest stretches as far as Plettenberg's Bay, distant nearly two hundred miles. A great variety of valuable timber grows along this tract of coast, from which the indolence or apathy of the Dutch Government prevented the colonists from deriving any considerable benefit. The only species of timber that has been introduced into common use is the *Geel Kout*, *Taxus* (*Podocarpus*) *elongata*, which is employed in house-building. For furniture, they occasionally use *Stink Hout* (*Laurus teterrima?*), though the execrable odour it diffuses for some time after it has been worked, forms a well-grounded objection to its general adoption. It possesses the colour, hardness, and durability of the heart of oak.

"Many of the indigenous plants of the Colony would probably be found endowed with valuable properties, if requisite means were employed to investigate them; but no steps to this effect have hitherto been taken. The gross ignorance of the peasantry utterly disqualifies them for researches of this nature; and it has been the policy of the Dutch Government to repress all attempts at discovery; nor has the British, which succeeded, shown itself more friendly to the scheme. Yet it is surely the policy of every government that obtains possession of an unexplored territory, to embrace the earliest opportunity of investigating its natural productions. The expense attending such an undertaking can never form a serious obstacle. Numbers will be found in every community who would take it in hand without any emolument, but as an object of honourable distinction.

" In the forest near Algoa Bay, I remarked three species of *Cissus.* The largest sort climbs up to the tops of the tallest trees, adorning them with garlands of the most vivid green. The leaf in its outline resembles that of the *Ivy.* The fruit is larger than our *red cherry*, pulpy, grateful to the taste, and leaving the slightest impression of acrimony on the palate. Its colour is a deep purple. The fruit of the second species is of a greenish colour, the size of a common grape, rough to the taste, and intolerably acrid. The leaf is fleshy, wrinkled, and divided into five lobes. The fruit of the third is about as large as a pea, of a purple colour, and sweetish taste.

" Visiting Dr. Vanderkemp, at his Hottentot village of Besseldorf, he showed me a shrub growing plentifully in the district, the properties of which seem to entitle it to more careful notice. I did not see it in flower, therefore cannot describe its botanical characters. It rises to the height of seven or eight feet, in a close bushy form. The leaves are about two inches in length, lance-shaped, and serrated. The fruit, equalling that of a small grape, is covered with a rough coriaceous capsule, which opens vertically into two sections, exposing to view a pulpy rose-coloured arillus. Within this envelope, which is of a delicate acid taste, is a kernel the size of a large pea, covered with a thin shell, and rivalling, in taste and flavour, the finest filbert. By bruising these kernels, and boiling them in water, the boors procure a large quantity of oil, which they apply to various economical purposes, and I have not the least doubt, that, if the fruit were subjected in a skilful manner to the press, it would yield an oil equal in flavour to the finest extracted from the olive. *Quere*—Is this shrub a *Dimocarpus?*

" The *Speckboom* (*Portulacaria Afra*) is common in the eastern parts of the Colony, but does not grow in the vicinity of the Cape. It is an ornamental shrub. The leaves are small, cuneiform, fleshy, and of an agreeably acid taste. The wood is as soft as a cabbage-stock, and separates into thin layers, which exhibit a delicate net-work, resembling that of the *Paper Mulberry.* In no part of the world, indeed, are the ornamental productions of the vegetable kingdom

so varied, or so profusely scattered, as over the arid sands of South Africa. Amidst all the beauties of that kingdom, the Cape *Heaths* stand confessedly unrivalled. Nature has not restricted these elegant shrubs to one particular soil or situation. You meet with them in the marshes, and on the banks of rivers; in the richest soil, and on the bare mural cliffs; on the acclivities of the hills, and the tops of the highest mountains. The form of their flowers is as varied as their colours. Some are shaped like a cup, some are globular, some exhibit the figure of a cone, others that of a cylinder contracted at the mouth, or swelled out like a trumpet; some are smooth and glossy; others covered with down, or with mucilage. The predominant colour is red; but you meet with them white, green, and purple; of every colour, in short, but blue; a fact which deserves notice, when we consider the almost unlimited extent of the genus; there being already upwards of three hundred species recorded.

"Next to the *Heaths* in variety and beauty, stand the *Proteas*. In the stem, the leaves, the flower, and the fruit of these plants, there appears such diversity, as if Nature had created them with a view to setting botanical arrangement at defiance; and the name imposed on the genus would seem to indicate that she has been in some degree successful. The *Protea argentea* grows to the height of a middling-sized tree; while the *Protea repens?* at the other extreme, creeps along the sand, and bears at the point of its slender stem, a flower, which, from its size and colour, might be mistaken for an orange. The intermediate space is occupied by upwards of sixty species, which display an astonishing diversity in form and habit. Some have small flowers which attract the attention of no one except the Botanist; others at the elevation of a few inches, bear a blossom that exceeds in size the crown of a hat, and excites the admiration of the most careless observer. In the flowers of some species, particularly the *Protea mellifera*, a vast quantity of honey is secreted, which attracts swarms of bees, beetles, and other insects, whose variegated colours and active movements heighten the interest of the scene; nor is this interest at all diminished when the *Certhia*

chalybea, or *Cape Humming-Bird*, joins the animated groupe, and, perching on the border of the chalice, darts its tubular tongue into the bottom of the flower, or snaps at the insects as they buzz around.

"The Colony owes some gratitude to the person who introduced the *Pine* to an acquaintance with the *Protea argentea*. The contrast is not stronger between a black man and a white, than between these trees; yet, like them, they possess several striking points of resemblance. The seeds in both, for instance, are contained in cones; when once cut down, neither of them revives in shoots from the trunk; the annual branches in both spring out in a circle round the stem; and in both, the branches, as well as the minute twigs, are covered with leaves. But the leaves of the *Pine* are mere lines without breadth, smooth, rigid, and of a dark green colour; whereas, those of the *Protea* are lance-shaped, soft, and clothed with a white shag, more delicate than silk, which, blending its colour with the white *parenchyma* of the leaf, gives it the appearance of sky-blue satin. The effect of a strong wind on the mingled foliage of these trees is peculiarly pleasing.

"The *Protea argentea* is diœcious. The fertile flowers are separated by the scale of the cone. The corolla is 4-petalous, tubular at the base, coherent at the throat, and the border, covered externally with long white hairs, spreads over the edge of the scale. After the germ has been fecundated, the scales begin to grow, and at length overtop the petals, gathering them in a bunch entirely concealed from view. When the fruit is become ripe, the sun begins to act on the scales; they curl out at the top, and contract at the base, gradually squeezing out the nut, until it arrives at the top of the aperture,—an operation facilitated by the claws of the petals, which had expanded during the process of maturition into a thin pellicle, covering the nut, and enabling it to slide smoothly through the narrow interstices of the scales. While the nut is in the act of emerging, the border of the corolla again spreads out, and the down stands erect, giving it a feathery appearance, resembling the seed-down of a syngen-

esious plant. In this state it remains ready to be wafted by the first gale that blows; but, to insure the ultimate object of Nature, the transportation of the seed, the long capillary style and its round stigma remain attached to it, and the latter being too large to slip through the narrow throat of the corolla, the seed is thus suspended by the style, and descends to the ground somewhat in the manner of an aeronaut in his parachute.

"Amongst a great variety of plants almost peculiar to South Africa, the *Mesembryanthemum*, or *Fig-Marigold*, deserves particular notice. The principal species of this plant, of which upwards of one hundred * are enumerated, seem admirably adapted for fixing the loose, shifting sand, with which a great part of this country is covered. Spreading over the ground from a central point, a single plant shades a great extent of surface, and affords a singular relief to the eye oppressed by the powerful reflection of light. In its thick fleshy leaves, it possesses a magazine of juices, which enables it to bear without shrinking a long privation of moisture, at the same time that it gives shelter to the nascent shoots of other plants which spring up in its bosom. The mucilaginous capsules of the *Mesembryanthemum edule*, or *Hottentot Fig*, are the chief material of an agreeable preserve.

"The sprouts of the *Anthericum hispidum* are eaten as a substitute for *Asparagus*. They are by no means unpalatable, though a certain clamminess they possess, which induces the same sensation as if a person was pulling hairs from between his lips, renders them at first unpleasant. The root of a species of *Liane*, which grows to upwards of a stone weight, is eaten by the Hottentots, and goes by the name of the *Hottentot Melon*. It is firmer in substance than a turnep, and resembles it in taste, but without its acrimony. Might not this root, if carefully cultivated, prove a good substitute for the *Manioc*, with which the black population of South America and the West Indies is chiefly fed? Even in its

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* Three hundred and sixteen in De Candolle's "Prodromus Systematis Vegetabilium." *Ed.*

wild state, it grows to a larger size, is nearly as farinaceous, and destitute of the deleterious quality inherent in the latter. It is worthy of remark, that, besides this plant, a great variety of others, native of the Cape, trees as well as herbs, yield a milky sap void of all taste; several species even of *Euphorbia* are of this description; whereas, in cold climates, lactescent plants are invariably bitter or acrimonious.

" The stem of the *Zamia cycadæfolia*, when stripped of its leaves, resembles a large *Pine-apple.* It is called the *Hottentot Bread-fruit.* These people bury it for some months in the ground, then pound it, and extract a quantity of farinaceous matter of the nature of *Sago.* With infinite labour they dig the root of a species of *Antholyza*, which lodges at the depth of a foot or more in the hardest gravelly soil. To accomplish this, they are under the necessity of using an iron crowbar, and the produce of half an hour's toil, which they call *Untjie*, does not exceed the bulk of a chestnut. Various other bulbs, of the classes *Triandria* and *Hexandria*, are esculent; but the long period of time requisite for their full developement, will for ever prevent their cultivation as articles of food.— The flowering spikes of the *Aponogeton distachyon*, known by the name of *Water Untjie*, are in high repute as a pickle.— The *Arctopus echinatus* * has recently acquired a considerable share of reputation as an antisyphilitic. The discovery of its virtues is due to the Malays, who have been for a long time in the practice of using it. It has been tried by several of the medical gentlemen of the garrison at the Cape, and their report is, on the whole, favourable. The root bears some resemblance to that of the parsnep, and is the only part used. It is boiled in water, and the decoction administered to the extent of a quart daily. It operates without any perceptible effect on the constitution.—The *Candleberry Myrtle* (*Myrica quercifolia*) grows along the coast, on dry sandy plains exposed to the sea air, where hardly any other plant

" * I had the good fortune to discover a second species of this plant, of which only one had previously been known. I gave it, with the rest of my collection, to my friend, Mr. R. Brown."

will vegetate. The *wax* is in the form of a rough crust investing the berries, and is extracted by boiling them in water, straining the decoction, and suffering it to cool. It is of a greenish colour, and possesses the hardness, without the tenacity of bees' wax. When made into candles, it gives a very fine light.

"The vegetable productions of the country surrounding Algoa Bay, are in many respects different from those of the vicinity of Capetown. The *Heaths* and *Proteas* almost disappear, and in their room we have numerous species of *Aloe* and *Euphorbia.* These, for the most part, garnish the rocks and precipices; the *Aloe perfoliata* alone occupies the plains, and, with its superb scarlet spikes, resembles, at a distance, skirmishing parties of British soldiers. A singular species of *Euphorbia* (*E. Caput Medusæ?*) grows also in the plains among the grass, where it appears as a round ball, without stem or leaves, and bears a striking resemblance in shape to the common *Echinus.* In dry weather the cattle eat it for the sake of its juice.

"To give an idea of the immense shoals of fish that prowl about the shores, I may mention the barbarous method by which the *Harder* (*Mugil crenilabis*), and other small fish, are sometimes taken off the Jettée. The sportsman employs a piece of Spanish reed, to which he attaches a few fathoms of hand-line, and to the extremity of the line three or four hooks in the form of a grapnel: he drops this to the bottom, and on pulling smartly, brings up two or three fish at a time. But the barbarity of this mode of fishing is surpassed, if possible, by the indelicacy of another, to which I was often an eye-witness when on guard at Rogge Bay. This little inlet is a sort of harbour in miniature, where the fishing boats are laid up during the night. As it is the nearest and most convenient spot, all the offerings to Cloacina are carried thither by slaves at the dawn, and deposited within high-water mark. The fishermen watch the return of the tide; and when the deposit is washed away and diffused over the bay, haul their nets, and seldom fail to take a copious draught of *Harders.* It is probable that the

food which allures this fish to Rogge Bay, also improves its flavour; for I could observe, that they were always greedily bought up the instant that they were hauled ashore. The *Harder* is usually salted, and in that state, is no bad substitute for the *Herring*.

"No part of the coast affords greater abundance or more variety of fish than Algoa Bay. But what struck me as most worthy of notice was the vast variety of species associated in the same shoal. Whenever the weather permitted, we had only to push off to a short distance from shore, and rarely failed to load our boat in the course of a few hours. The common and the red *Steinbrassen*, the *Boskop*, the *Hottentot fish*, the *Roman fish*, the *Galeon fish*, the *Geelbek*, and *Cabillau*, were invariably found together. The favourite bait for all was the flesh of the shark, and as there were always three or four species of these animals prowling among the shoal, we never found ourselves at a loss.

"The character of the *Shark* for voracity is of long standing, and so firmly believed as to have become proverbial; it is, nevertheless, a doubt with me whether it be a merited one. We are so much more acutely sensitive to whatever touches ourselves, that when our personal feelings come into play, we are apt to lose sight of all general considerations. We have attached the epithet ravenous to the shark, not because his appetite is with more difficulty satisfied, but because, to satisfy it, he attacks man as well as other animals. When we see the *Albicore* and *Bonito* pursue the flying-fish, and devour them in myriads, both in the air and in the water, we regard the scene with great coolness, and talk of the matter merely as a curious fact in Natural History. But when we behold a shark seizing a messmate who has chanced to fall overboard, and biting off a leg or an arm, or perhaps swallowing him up at once, the case becomes very different. We feel that our own turn may come next, and under that horrible impression, lavish all the worst terms in the language on the animal that shows so little respect for the lord of the creation. On the same principle, the *Crocodile* bears a character as bad; and the *Royal Tiger*, equally uncere-

monious in gratifying his appetite, is designated by the same terms; while the *Lion*, merely from some poetical and fictitious notion, that has been long current, of standing in awe of mankind, is invested with a character for nobleness and generosity to which he has no title whatever.

"The shark is perhaps more undistinguishing in his appetite than any other fish, and is sometimes observed to swallow matters from which he can derive no nutriment; but this goes merely to prove, that whatever may be the nature of his appetites, he has not always the power of gratifying them; for no person can be so weak as to believe that the shark swallows lumps of rusty iron by way of a relish. The fact is, that his form is so awkward, and his motion so sluggish, that there is hardly any species of fish but can easily evade his attacks. He is thus condemned to many long fasts, which urge him to snatch at every thing animate and inanimate that comes in his way. A large shark one day knocked the rudder of our boat off its hinges, with a stroke of his tail, and made repeated attempts to bite it as it floated along. But this ought not to be regarded so much as a proof of the animal's voracity, as of his want of the faculty of discrimination. From all I could observe, every other species of fish seemed equally ravenous with the shark; and as they were much more active in their movements, could glut themselves with less trouble. The whole appeared a scene of unceasing carnage,—the small falling a prey to the large, and the weak to the vigorous. It was nothing uncommon with us, after hooking a small fish, to pull up also a large one, that had swallowed it, hook and all, on its way. Nature employs various means to qualify this universal rage for destruction. The projecting snout of the shark, often gives the alarm to its prey, and pushes it out of its reach; the teeth of the *Boskop*, and of several others of the larger *Spari*, are mere hemisphærical stumps, ill adapted for taking a firm hold; but the greatest protectors are the scales, by means of which the prey, if too large to be gorged at once, disengages itself from its enemy by a jerk, leaving many of them sticking in its teeth.

" There is no animal whose Natural History is so much mixed up with error and fable as that of the shark. In Darwin's 'Temple of Nature,' we find the following note, every one assertion in which is erroneous:—'The shark has three rows of teeth within each other, which he can bend downwards to admit prey, and raise to prevent its return. His snout hangs over his mouth so far that he is necessitated to swim upon his back when he takes those that swim over him; and hence seems peculiarly formed to catch those that swim under him.'

" In the first place, the shark is not limited to three rows of teeth. In numerous specimens which I examined, there were eight or nine rows in progressive stages of growth; the outer row of course full grown, erect, or slightly inclining inwards; the next row inclining a little more; and so on to the inmost, which were mere embryos, buried in the ligamentous covering of the jaw-bone. Such a reserve seems necessary for the preservation of the animal. His appetite, as I have already mentioned, is so undiscerning that he often bites at substances that prove too hard to be cut, or too tough to be lacerated; and his teeth are thus liable to be broken or torn up by the roots. When this happens, the teeth of the second row gradually rise up and take their place. In several of the specimens above alluded to, I remarked two or three teeth, in their progress to fill up a gap thus made, standing midway between the first and the second rows. But this disposition of teeth is by no means peculiar to the shark. In the *Spari*, among many others, the jaws are literally paved and hackled with teeth, crowded together in the utmost disorder, and it is rarely that you find the front teeth complete.

" In the second place, the shark has not the power to bend down, or to raise his teeth at pleasure. Though not absolutely lodged in sockets, they are so firmly fixed as to be incapable of the sudden and effective motion implied in the note. If the prey was to be retained in his mouth, and there digested, such a construction would perhaps be necessary; but as it passes on without impediment into his stomach, no peculiar contrivance of teeth seems to be called for.

" In the third place, the shark needs not necessarily turn on his back to catch his prey, whatever may be its position. His eyes are so placed that he cannot distinctly see an object over, under, or directly before him; he must, therefore, push alongside, so as to bear one eye upon it; and to bring his mouth in contact with it, must turn upon his side. This movement, when overdone, which it often is, throws him, of course, on his back, and has given rise to the notion that such a posture is indispensable.

" The value of the profusion of fine fish that frequent Algoa Bay is greatly enhanced by the vicinity of an extensive salt-pond, from which the whole district draws its supply of that useful article. The pond is situated on the other side of the Swartzkop River, about eight miles from the cantonment, and five from the shore, above which it is considerably elevated. It is between two and three miles in circumference, and, as might be expected, without any outlet. I visited this reservoir, with a party from the garrison, in the month of January, when the heat of the sun had dried it up except in the centre, which always retains more or less water. We broke through the saline deposit, at a considerable distance from the border, and found it eighteen inches deep. The annual accretions are about an inch thick, and easily distinguishable by the interposition of thin layers of mud. In summer, when the water is nearly evaporated, the loose particles of salt are blown about by the wind, and collected in small wreaths, as pure and as white as the driven snow. The industrious housewives of Urtenhage and Graaf Reynett set a high value on this drifted salt, and charge their husbands to bring home as much of it as they can collect, when they go to the pond for salt, or pass near it on their return from Capetown.

" When we had satisfied our curiosity regarding this object, we proposed to lengthen our ride for six miles farther, to a mineral spring celebrated throughout the district for its medicinal virtues. The water we found to be a strong chalybeate, and of the temperature of the blood. It deposits its iron on the sides of the channel, in the form of a yellow

sediment, which is collected by the boors and employed to paint their waggons.

"As it was too late to return to the cantonment, we agreed to throw ourselves for the night on the hospitality of a boor, who lived at a short distance from the spring. When we expressed our intention to Van Royen, he signified his satisfaction, in the homely but hearty language of welcome, in which few of the boors are deficient. He sent instantly to the Kraal, to fetch a lamb, which was slaughtered before our eyes: the operator, a female, one of his Hottentot domestics. After we had sate for some time conversing, a servant came round with a bucket of water to wash our feet: on our declining her services, she went to our host, his wife, and children, and washed their feet in succession. This circumstance, together with the killing of the lamb, brought to my recollection the history of Abraham entertaining the three angels. The African boors are as strictly in the pastoral state of society as the patriarchs were of old.

"The supper-table was set out in much neater style than is usual among the boors. Each of us had a plate, a knife and fork, a spoon, and a clean white napkin placed before us. The lamb, stewed to rags, occupied the middle, and a dish of sweet potatoes, with a tureen, full of milk, and a salad, garnished the corners.

"We had provided ourselves with some brandy, which we contrived to manufacture into punch after supper. The old Vrow seemed to relish this mixture amazingly. After swallowing a few glasses she got merry, and her tongue never rested. But Van Royen himself could not be prevailed upon to touch it; and, if what he told us be true, he is a *rara avis* among the boors of the Cape. He declared solemnly that he never in his life tasted either wine, brandy, tea, or coffee; nor did he recollect ever having used tobacco in any shape; to all which luxuries the boors in general are passionately addicted. They seldom use sugar to their tea or coffee. The former they call tea-water; and no beverage was ever more aptly denominated. The quantity originally infused would scarcely make one cupful of ordinary strength; and on

this pittance they keep pouring hot water, until the leaves are almost literally dissolved, and the fluid comes out in its native purity.

"The farms around Algoa Bay consist, as in the rest of the Colony, of portions of land three miles square, on which an annual and fixed rent of twenty Rix-dollars is imposed. A trifling tax is also levied on every head of black cattle in possession of the occupant, and on every hundred sheep. The surplus of the live-stock is purchased at certain seasons of the year by dealers from Swellendam and the districts near the Cape, where they are pastured for some time, and fattened for the supply of the market.

"Every farmer goes once or twice a year to Capetown, to exchange his salted butter for such articles as his household may require, particularly clothing and iron. This journey is a formidable undertaking, on account of the distance, in some cases six hundred miles, as well as the badness of the roads, and the danger of fording the rivers. They always travel with their waggons, which are exceedingly strong, heavy, and well adapted for bearing, without injury, the constant jolting and twisting they are liable to in passing over the broken ground. They are built long and narrow: a construction that exposes them in a peculiar manner to the risk of being overturned in going over the rocks and channels with which the roads are intersected. On those emergencies, a set of cords are attached to the upper works of the waggon, and all hands pull at them to preserve the equilibrium of the vehicle. There are seldom more than six pair of oxen yoked at a time, except while passing through a defile, or ascending a steep hill, when double that number is sometimes necessary; but they always travel with a pair or two in reserve for the above purpose, and to supply the loss incurred from the numerous casualties to which the oxen are exposed.

"Every draught ox has a particular name, which he acknowledges by quickening his pace whenever it is called. The driver uses a whip, the stock of which is a *Bamboo* about fifteen feet long. The whip itself, including the lash, is still longer. He keeps smacking this unwieldy weapon to the

right and left, to rouse the exertions of his cattle; giving the sluggards an occasional touch, that seldom fails to leave its impression on their hide. By constant practice, these drivers become such dexterous marksmen as to be able to hit the smallest object within reach of their lash. I once saw a boor-lad kill a sparrow, at the distance of ten yards, with a smack of his enormous whip, though the waggon was in motion at the time.

"The boors settled near the borders of Caffreland are in a constant state of vigilance, and prepared for a retreat, on the first symptom of a rupture with their savage neighbours. They are always provided with a sufficient number of waggons to transport their families and furniture, the latter of which is limited to articles of prime necessity. They consequently feel themselves as much at home within their 'wooden walls' as in the miserable huts which they forsake without any violent regret. Thus the whole population of a district have been known to move with their herds and flocks, like so many hordes of wandering Tartars. This uncertainty in the stability of their tenures renders them little solicitous to improve their grounds any more than their habitations. A few of the most ordinary culinary vegetables, and as much grain as will serve for the consumption of the family, are all that they ever attempt to cultivate. In lieu of bread, they sometimes use the flesh of various animals, salted and dried in the sun. To prepare this substitute, which they call 'Belltong,' the fleshy parts of the larger animals, such as the *Ox*, the *Eland*, the *Buffalo*, the *Hart-beest*, and even the *Ostrich*, are detached from the bones, and the muscles dried separately; the hams and shoulders of the smaller animals being cured whole. As dried flesh, this preparation is excellent; but I do not greatly admire it as a substitute for bread, though I have no doubt that it is much more palatable and nutritious than the Norwegian bread manufactured of fish-bones and pine-bark.

"The Cape boor is an expert marksman, and seldom misses his object. Sunday is usually his sporting day. He always hunts on horseback, with a heavy gun over his

shoulder, which throws a ball weighing from an ounce and a half to three ounces. The instant the game is sprung, he dismounts, drops on his right knee, and takes a deliberate aim. The horse, in the meantime, stands fast, nor would he stir from the spot, should his master not return for an hour. The Cape horses are trained to this steadiness from the time they first become acquainted with the bridle. If the rider drops the rein on the ground when he dismounts, the horse is taught to consider it as a signal to stand; but should this be neglected, he walks off without any ceremony.

"When a boor has returned from Capetown with a cask of brandy-wine, which he seldom forgets, the news spreads like wild-fire, and you see the neighbours flocking in from all quarters like vultures or carrion-crows at the scent of a carcase. It is on such occasions that you can best observe the benefit, and the chief intention indeed, of the training they give their horses. For every boor that sits tippling in the house, you will see a horse standing at the door, where he will remain fixed from morning till night without a morsel to eat. From the time the cask is first broached, until the melancholy moment when it finally ceases to flow, the house is one continued scene of riot and confusion: one party, turning out in a brutal state of intoxication, is succeeded by another and another, who, in their turn, depart in the same condition.

"There is a strict prohibition against the sale of gunpowder or lead to the boors; government having taken upon itself the task of dealing out these dangerous articles among them. To prevent the chance of individuals making an improper accumulation, an order from the Colonial Secretary to the Ordnance Store-keeper must accompany every requisition; and a correct register of these orders is kept in the office, to which a reference is made when applications are too often repeated. At each of the Drostdies, there is a subordinate magazine for the supply of the distant Colonists.

"These vexatious, though perhaps necessary restrictions, have rendered ammunition so dear and scarce, that a boor

never thinks of shooting for amusement, but strictly confines himself to such game as will repay him the expense of his powder and shot. Partridges and pheasants are beneath his notice; nor will he burn powder even at wild geese, unless he falls in with a flock, from which he can bring down half a dozen at a shot. Excepting the ostrich, the only article of feathered game he will venture on singly is the *Paaw*, or wild peacock, which, weighing nearly a quarter of a hundred weight, furnishes a comfortable meal for his whole household. Balls and buckshot are the only kinds of shot they ever use. The latter they call 'Loupers.' A boor to whom I once gave some charges of small shot to kill a *Caffre Finch* (*Emberiza longicauda*) for me, returned some days thereafter with a fine bird in his hand, which, on examination, I found perforated with eight or nine of his infernal loupers, the mangled carcase scarcely holding together. The barbarian told me, with infinite complacency, that he had fired away all my *hagel*, but could not hit anything with it.

"This same boor was dining one day at our little mess, and had just been helped to a liberal allowance of salt fish and butter, which he was bolting down, when a roasted fowl was placed before our President, Captain Lawrence, with a request to carve and send it round. Finding some difficulty in fixing the fowl to his satisfaction, the boor, good-naturedly, made a long arm and stuck his fork, just extracted from his jaws, into its side. 'Now Mynheer Capitano,' said he, 'cut, ik sall hold it.' Lawrence, with a rueful politeness, thanked his officious guest, while the tragi-comic cast of his visage excited the risibility of every one present.

"Of the little learning diffused among this people, the women possess the greater portion, though even that rarely extends beyond the first rude elements of reading and writing. But, to their honour be it said, their ignorance is far from voluntary. On the contrary, they show all possible anxiety to procure for their children what share of education they can. In many of the more respectable families, you

meet with a person who goes by the title of schoolmaster; but the acquirements of these pedagogues are rarely such as prove of much benefit to their pupils. Originally deserters, or discharged from military service in Capetown, these vagrants stroll about the country, and impose themselves on the ignorance and credulity of the peasantry, as fully qualified to instruct their children.

"In this country, distance is computed by hours instead of miles. If you ask how far one place is from another, they will answer, so many hours on horseback, or, so many with a waggon. The hour on horseback is reckoned equal to six miles; with the waggon, to half that number. Even the boundaries of their farms are fixed in this compendious manner, being an hour's walk in every direction.

"Adjacent to every farm-house, there are two areas fenced in with *Mimosa* bushes, laid in the manner of abattis. One of these, termed the 'Beast Kraal,' is appropriated for the black cattle; and here the cows are milked before they go out to feed in the morning, and after they return home for the night. The other receives the sheep and the goats. It has been adduced as a proof of extreme indolence in the boors, that they never remove the dung from the kraals to manure their arable ground, but suffer it to accumulate until it overtops the fence, and obliges them to enclose a fresh spot. It would be more correct, perhaps, to ascribe it to the natural fertility of the soil, and the want of a ready market for its produce. The detriment to the cattle, from this slovenly at least, if not improvident, piece of economy, turns out, at times, rather serious. I was myself a witness to the loss of thirty sheep in one small kraal in the course of a rainy night. The bottom on which they stood had become so soft, that they sunk in it up to the belly, and were literally smothered in their own dung.

"Another object that often strikes the eye of the traveller approaching a farm-house, is a long pole fixed in the ground, with a flat board on the top, and a baboon exhibiting his antics on it. Jacko is a great favourite with the boors, and deservedly so. In the course of his domestica-

tion, he learns a variety of tricks highly diverting to these people, who cannot boast of much refinement of taste. The Cape baboon is a variety of the *Simia Hamadryas.* They may be seen in large flocks, skipping along the mountain-cliffs, and attain to great size and strength. It is not altogether safe to get among such a flock; and I have been more than once not a little alarmed on finding myself unexpectedly in the midst of two or three dozen of them, prowling about for roots and berries. Another favourite among the boors is the *Green Monkey,* (*Simia Sabæa,*) which abounds in the forests, and is one of the most beautiful and gentle of the tribe; but, like the rest of its congeners, full of curiosity and mischief.

"I remarked one instance of delicacy in the domestic economy of the boors, which I should never have dreamed of at the further extremity of Africa. They never kill any of their poultry till after they have been cooped up for a month or six weeks, and fed on grain; nor do they eat any of their eggs, except such as are laid during their confinement. I was at a loss to account for this piece of affectation, as I thought it, but was satisfied of its propriety from a single hint—that the domestic Hottentots in these families are all fed, for the most part, on maize or wheat, boiled in the grain. . . . .

"The farmers in the remote parts of the Colony are but sparingly provided with household furniture. Deprived of the ox-hide and the calabash, the boor would be as destitute as the South Sea Islander without the cocoa tree. In his hands, the calabash is a perfect Proteus; you see it in all corners of the hut, in the form of plates, bowls, jugs, bottles, and drinking cups. The ox-hide has more employments than Scrub, in the play. It is a substitute for all sorts of cordage; it is made into drag-ropes for the waggon, head-stalls for the oxen, bridles for the horses, cordage for thatching the hut, slips for bottoming the beds, chairs and stools, pickling-tubs for his beef, and *feldt schoon* for himself and family. . . . .

"With all these drawbacks on his comfort, it must never-

theless be allowed, that, so far as regards mere sensual gratification, and he is unqualified for enjoying any other, the African boor is much better off, more at his ease, and less harrassed by cares, than the labouring class of society in any part of Europe. Enter into any of their huts, and you will invariably find the whole or part of a carcase of mutton suspended from a beam, from which they help themselves at will, until the whole is consumed; and that not a grain of salt ever touches it, is a fair proof that it does not hang there long. They stew their meat to rags in sheep's-tail fat, or cut it into steaks and broil it over the coals. The latter they call 'Carbonatjie,' a term of extensive import. You have it in the various forms of beef-steak, mutton-chop, veal-cutlet, and pork-relish. When a bullock is slaughtered, the flesh is cut into junks, and sprinkled over with salt, then rolled up in the bloody hide.

"I went frequently to see Dr. Vanderkemp at his Hottentot establishment, nine miles from the cantonment. This extraordinary personage, who has created so much noise in the evangelical world, is a striking example of the power of enthusiasm, aided, perhaps, by a share of vanity, in overturning the deeply rooted habits of civilized life. He has reduced to practice the captivating picture of the Golden Age, which poets and philosophers have taken so much delight in viewing in the abstract. For the last eight years, he has denied himself all the luxuries and comforts to which his rank and fortune entitled him, and circumscribed his wants within the strictest limits that nature demands. In his dress he is as primitive as a Hottentot. A coarse sailor's jacket, and a pair of sheepskin trowsers, form the whole of his drapery. His bald head is become a stranger to the luxury of a hat, and his feet to that of shoes and stockings.

"Vanderkemp is descended from a respectable family in Holland. He studied medicine at Leyden, then entered into the army, where, after a service of sixteen years, he attained the rank of Captain of Dragoons; but having displayed certain peculiarities of disposition repugnant to the established prejudices of that profession, he found it

necessary to retire. He then resumed his original profession, went to Edinburgh, studied there for some years, took out his degree, and, on his return home, commenced practice as a physician, in which capacity he had the charge of a large military hospital during the campaigns of 1793–4. On the termination of the war, he retired from employment, and lived on his private fortune.

"In the earlier part of his career, the Dr. is said to have been rather heterodox in his religious opinions, openly professing himself a deist. But the loss of his wife and child, by a disastrous accident, gave a new turn to his ideas; and he suddenly became devoted to the doctrines of the Christian religion. In this frame of mind, having accidentally got sight of the scheme circulated by the Missionary Society for propagating the Gospel among the Heathen; his imagination caught a spark of the sacred flame, and he offered to undertake a mission among the savage tribes of Africa.

"The acquisition of such a man as Vanderkemp, high in rank, in fortune, in learning, and in reputation, was of the utmost importance to the objects of the society. No time was therefore lost in forwarding him to the field of his missionary labours. In the beginning of the year 1799, he arrived at the Cape, and after a short stay in the capital, proceeded to Caffreland. This was an undertaking of extreme hazard, on account of the war carried on at that time against the British Government by the boors of the frontier, and against both by the Caffres. After a good deal of trouble, however, he made his way to King Gaika's court, where he remained for sixteen months, environed, according to his own account, by all sorts of danger and temptation, bodily as well as spiritual. But finding that his zeal among these savages was likely to be its own reward, he returned to the Colony.

"Meeting with General Dundas on his return, the latter recommended to his notice the Hottentots dispersed over the district of Graaf Reynett, and promised to facilitate any plan he might form to collect them into one society. In this undertaking the Dr. was more successful than in his

last; and had a multitude of those people collected under his charge, when the restoration of the Colony to its ancient masters threw every thing again into confusion. The boors, who detested the institution as a scheme to inveigle the Hottentots from their service, lost no time in representing the matter to Governor Jansens, and that in so obnoxious a light, that Vanderkemp was recalled to Capetown as a partizan of the English, and detained there, as a prisoner at large, until the Colony returned once more into our possession. On this auspicious event, he was remanded to his charge with renewed promises of protection; where, it is to be hoped, he will finally succeed in an undertaking the most gratifying to a benevolent mind, alleviating the miseries of an oppressed and degraded race.

"Still, however, a sort of jealousy appears to exist between Vanderkemp and the Government. The spot on which the institution has been established is confessedly the least proper that could be selected for the purpose. Barren, destitute of wood, and adapted solely for pasturage, it affords no scope for the exertion of industry, and the people are lost in a hopeless state of idleness. Both parties are agreed on this capital defect, and on the propriety of removing the establishment to a more eligible spot; but the difficulty of fixing on this spot has hitherto frustrated their endeavours. Vanderkemp, whose views are still directed towards the conversion of the Caffres, is desirous to have the institution transferred to the banks of the Sunday River, so as to get within call of his old friend King Gaika; but Government, eyeing the matter in a political light, wish to avoid any close approximation of the Hottentots with the Caffres, as tending eventually to disturb the peace of the Colony, and would have it, on that account, removed nearer the capital. What the arguments are that sustain the weaker against the stronger side, I have not learned; but thus the business at present rests, in verification of the proverb.

"The Hottentots of the institution were constantly about us, visiting their friends of the Cape regiment. These people are passionately fond of riding; and, as the keeping

of horses is beyond their means, they train their finest oxen to bear the saddle, or rather a sheepskin, as its homely substitute. The course of education commences while the animal is still very young. They begin by perforating the cartilage of his nose, and introducing a wooden pin into the hole. After the wound has become callous, they fix a slip of hide to the pin, by way of a bridle, and lead him about; then they accustom him to bear the sheepskin and girth, and to walk, trot, and canter alongside of a trained beast. After he has become perfect in his paces, the most daring of them undertakes the office of rough-rider, and a great deal of kicking, tossing, and tumbling ensues, but he is at length brought to reason, and submits quietly to his fate.

"In the month of March I went on a shooting excursion to Quagga's Plain, in company with two other officers of the garrison. The usual mode of travelling in this country is on horseback, or in a waggon. With the latter, which was the vehicle we chose, it is absolutely necessary to proceed in the cool of the morning and evening, the meridian heat being too oppressive to the cattle. We left the Bay early in the morning, and halted about ten o'clock at the Swartkop River. Six miles above the ford at which we crossed it, they have begun to build a village, which is intended to be the capital of the new Drostdy of Urtenhage, and is called by the same name; a practice hitherto invariably followed, but not to be approved of, as it necessarily creates some ambiguity. The Landrost's house, an extensive building, is already finished, and the ground is laid out for such as choose to settle in the village, in lots of forty yards square, for which they pay a quit-rent of forty Rix-dollars. They are entitled, besides, to the privilege of grazing a few cows on a neighbouring common.

"The Sunday River, which we crossed on the following morning, is a considerable stream. Its breadth, at this time, though the rainy season had not yet set in, was at least sixty yards. Its banks are clothed with wood, and exceedingly bold and romantic. Among a great variety of trees and shrubs, we could easily distinguish the *Doorn boom,*

a species of *Mimosa*, rising here to the height of fifty feet, though it never grows to any considerable height in the open plain, but spreads out like a parasol. This tree yields, by exudation through fissures in its bark, a great quantity of *gum*, which is as difficult of solution as *gum-tragacanth*. Its bark is employed by the boors for tanning leather. In the flowering season, it is a highly ornamental tree, its spherical tufts of orange-coloured flowers, presenting a striking contrast with its formidable, white, bifurcated thorns, and dark-green foliage.

"For eight or ten miles beyond the Sunday River, the wood is so thick, and the path so narrow, that there is hardly room for a waggon to pass along; so that when two meet, which sometimes happens, all hands are set to work with the axe, and clear a recess sufficient to receive one of the waggons, so as to let the other pass. This is one of the compensations which tend to equalize the condition of the colonist with that of persons of his class in long established communities. Both of them are doomed to hard labour. But the energies of the latter are exerted solely on production; whereas, with the former, the labour of production is a subordinate concern; his time and his sweat are expended in surmounting the obstacles which nature has scattered in the way of production. He has, however, one consolation, which is wanting to the other, he labours for himself, and neither landlord, nor tax-gatherer, nor tythe-proctor can come forward and claim a share in the fruits of his industry.

"Beyond this wood, the country is beautifully diversified with clumps of shrubbery, until you arrive at the Quagga's Plain, which is entirely bare. On the border of the latter I remarked a great number of those circles, called in England 'Fairy Rings.' Their area, in general about ten yards in diameter, was circumscribed by a ring three feet in breadth, of an intensely green colour, and covered with large mushrooms.

"We found no great variety of game on the plain; the great masses of the *Antelope* tribe having migrated in quest of water to other districts. The scarcity of this fluid

was indeed felt in a sensible degree by ourselves while we remained on the spot; our only supply being derived from the half-drained bottom of a stagnant pool, the muddy, whey-coloured contents of which were polluted by the hourly resort of all the wild animals that pastured around it. To purify it from its clayey mixture, we had recourse to the blood of our game, a few drops of which served to precipitate the earthy matter; but nothing could qualify the saline impregnation it had received from the dung and the urine of those animals, which rendered it a most nauseous and unpalatable beverage. Such as it was, the extreme heat of the weather, and the exercise incident to our amusement, obliged us to swallow it in quantities that would, under ordinary circumstances, have saved us the expense of an apothecary; but necessity reconciles the human stomach to a great number of its antipathies.

"The *Springbocks* (*Antilope Euchore*) are sometimes seen assembled in herds of ten thousand and upward. They have videttes or scouts constantly posted to warn the herd of approaching danger. From the moment the hunter comes in view, the sentinel keeps his eyes steadily fixed on him, watching all his motions; and on his advancing within a certain distance gives the signal of danger by a loud whistle, on hearing which, the whole herd sets off at full speed. The velocity of their motion, while flying from the object of their alarm, is agreeably diversified, if not increased, by that peculiarity of gait from which they derive their name. While passing over the smoothest ground, and where no obstacle whatever occurs, individuals among them are seen, apparently from playfulness or caprice, springing up in the air to the height of ten or twelve feet, as if they were leaping over a high hedge; at the same time the long hair on their rump divides or sheds over their haunches, and displays a surface of snowy whiteness.

"The second day after our arrival, I walked out early in the morning, and sauntered for some time about the downs with one of my fellow-sportsmen, in search of game. At length we came suddenly upon a herd of *Springbocks*, and

discharged our pieces at random among them. Two of them, which fell dead, we secured; but a third, though severely wounded, made its escape. Instead of following its track, we went on to a rising ground at a short distance, which commanded an extensive view of the plain. While we stood admiring the beauty of the surrounding landscape, animated by innumerable groupes of animals ranging at liberty over its waving surface, we happened to turn our eyes towards the spot where we had left our game; and observed a prodigious flock of large birds, some fluttering on the ground, others soaring in the air above them. We ran down with all speed, and approaching within forty or fifty yards, discovered them to be a flock of vultures, engaged on the carcase of the buck which we had wounded. We instantly fired among them, but without any apparent effect. On examining the carcase, we found that in the short interval of our absence every particle of the flesh had been picked off the bones, and nothing left but the skeleton enclosed in the skin. The latter was quite uninjured, save one hole in the flank, where the grain of shot had penetrated. Through this hole and the anus, they had contrived to push in their heads, and tear away the flesh and entrails. How exquisite must the olfactory sense of the vulture be, when, in the short space of half an hour, the scent of blood could attract so many of them towards a spot where not a bird could be descried at the time the animal was wounded!

" Our success in this excursion fell, on the whole, rather short of our expectations. We bagged, according to the sporting phrase, only fourteen *Springbocks*, though we wounded many more. After wandering about for three days, exposed to the intemperate heat of that season, we bade adieu to Quagga's Plain, under the horrors of an impending thunder-storm. Its approach was gradual, and, notwithstanding the soaking we had in contemplation, it was impossible to avoid admiring the grandeur and sublimity of its progress. When the electric fluid shot from the clouds down to the earth, it was in single tremulous streams, of a bright purple tinge; but when it darted across the

heavens, it split into numerous branches, widely diverging from each other; and these horizontal coruscations extended sometimes to an astonishing distance.

"At length the storm burst directly over our heads. The lightning now became incessant; the heavens seemed all on fire; the thunder rolled in one continued peal; and the rain descended in torrents, which, collecting in our path, threatened to sweep us off our feet. During this uproar of the elements, every flash was followed by a momentary blindness. We pursued our way under the full conviction that the torrent which poured so unmercifully on us would swell the Sunday River to such a height as must detain us for some days on its bank. Nothing could equal the despondency caused by this reflection but the joy we felt, on arriving at the river, to find the ford still practicable. We dashed with all haste across the stream; and were preparing to congratulate each other on our miraculous escape, when our progress was arrested by an obstacle the more provoking as it was entirely unexpected. The opposite bank, at all times steep and difficult, had become so slippery in consequence of the rain, that our jaded cattle were unable to drag the waggon out of the river; and we were obliged, after a great deal of goading and flogging, to leave it all night moored to the bank, sunk over the wheels in the stream.

"We pitched our tent close to the ford; but the rain still continuing rendered it impossible to strike a fire; and we were compelled to lie down, wet and hungry, on mattrasses that had been just dragged out of the river. We turned out at the dawn in a state approaching to torpidity; but after running about for some time, to set our blood in motion, we had the consolation to find that our health had sustained no material injury. We kindled a fire, and presently sat down to a breakfast of *Springbock's* liver, garnished with salt pork, which a fast of twenty-four hours rendered uncommonly palatable.

"With the aid of a good-natured boor who was travelling the same road, we got the waggon hauled out of the river,

and continued our journey; but we had not advanced more than ten miles when all was again thrown into confusion. By the carelessness of our driver, the waggon was overturned, with Mr. Fraser and myself sitting in it at the time. It rolled down a steep bank, and went all to pieces over our heads. My companion escaped with a sprained ancle, and I had one of my ribs broken. During the rest of the journey, the jolting of the waggon kept me in perpetual torture.

"The Caffres were constant visitors to us at Algoa Bay. They used to come in parties of twenty or thirty at a time. Their chief view in making these visits was to receive some trifling presents which the Landrost was in the habit of making to them; and to enable him to fulfil this duty, without detriment to his purse, Government supplies him with a store of trinkets, such as knives, small looking-glasses, beads, buttons, sheet-copper, and so forth, which he is authorised to distribute at his discretion. He likewise supplies them with provisions during their stay at the garrison, for they never carry any food with them on these journeys; but apply to the boors as they travel along, who seldom think it prudent to refuse. Such of them as show any reluctance in this respect, or treat those sturdy beggars with incivility, are sure to have part of their cattle driven away on the first favourable opportunity. Depredations of this nature are daily committed on the outskirts of the colony; and so much do these marauders presume on the lenity of Government, that they have been known, more than once, to drive off cattle from within a few miles of the cantonment.

"Conga, the chief of one of these erratic tribes, has had the boldness to advance with his whole kraal into the very heart of the district, where he still remains with upwards of four thousand head of cattle. As an apology for this intrusion, he urges the failure of water in his country, owing to the unusual dryness of the season; and offers full permission to the boors to retaliate whenever a similar failure occurs on their side. The latter, however, are not quite satisfied with this arrangement, and would fain expel him by force; but Government very prudently declines coming to extremity, as

long as it can be avoided. I saw Conga sometime ago at the Bay, when the matter was discussed, and the Landrost received from him a reluctant promise to return to his own country. But we learned from subsequent intelligence that his progress in that direction was extremely slow, and attended by the usual tokens of his displeasure towards such of the boors as were obnoxious to himself or any of his followers.

"The Caffres are generally tall in their persons, erect, and extremely well limbed; their countenance open and cheerful, and their features pleasing. Their complexion nearly jet-black, sets off a regular set of teeth as white as ivory. But the constant use of a pigment made of grease and red-ochre, gives their skin a colour nearly approaching that of copper; and their mantles, arms, and every other article they are in the habit of handling, soon acquire a similar hue.

"The mantle, or kaross, is usually made of calves' skins stitched together, and pared round the skirts into the shape of a blanket. It is worn fixed round the neck, and descends as far as the calf of the leg. As it turns with ease round the neck, they can oppose it to the wind, whichever way it blows; and when they have occasion to throw their *Assagays*, they double it over their left arm, like the robe of the Belvidere Apollo. The women gird the mantle round their loins, and usually suffer the upper part to hang over: but when they are on a journey they tie it round the breast under the arm-pits, and in the bag formed between the two ligatures carry their youngest child, or their portable furniture. In addition to the mantle, they wear a small apron in front, and on the head a sort of turban made of the skin of the *Bushbock*, and shaped like the watering-caps of our dragoons. The most fashionable female ornament is a series of short, twisted strings of copper, which hangs over the forehead like the bullion of an epaulette. This singular piece of finery, which adorned the brows of only a few distinguished females, though it seemed to us misplaced, to say the least of it, appeared to add greatly to their importance in the eyes of their own people.

"Both sexes wear strings of beads intermixed with bits of aromatic wood, suspended round the neck, and bracelets of beads, buttons, or cowrie shells round the wrists; besides which, the men have a number of thick ivory rings upon the left arm. The loins of both are likewise girded with a string of copper or iron beads of their own manufacture. Their supernumerary buttons are disposed upon the back of the mantle, with some degree of arrangement and taste; not perhaps such as would meet the approbation of a Bond-Street tailor; but in matters of this sort, until the standard shall be finally fixed, every nation has a right to consider its own the best. The head-ornaments of the men are as various as they are fanciful. A tuft of white hair from the rump of the *Springbock*, a string of nerite shells, a fillet of monkey's skin, a plume of ostrich feathers, or the tail of a *Caffre Finch*.

"The offensive arms of the Caffres are the *Assagay* and the *Kiri*. The *Assagay* is a light spear, consisting of a slender shaft, five feet long, adapted to an iron head, in the fabrication of which the whole ingenuity of the Caffre is called into play; and it is really astonishing, that, with one stone for a hammer, and another for an anvil, such neat workmanship should be executed. They are very expert in the use of this weapon, and can dart it with tolerable precision to the distance of seventy or eighty yards. When thrown with dexterity, the shaft vibrates in the air like the tail of a fish when it moves rapidly through the water. The *Kiri* is a sort of walking-stick, about three feet long, with a large knob at the end. By a particular art in throwing it, they can kill a hare, antelope, or other small animal, at thirty yards' distance. Every Caffre carries in his hand a bundle, consisting of five or six *Assagays*, a *Kiri*, and a long taper stick, of hardwood, which serves to kindle their fire, and decide their private quarrels. These latter are, by all accounts, neither frequent nor sanguinary. Even when they become public, and assume the importance of civil or of international warfare, they are carried on with a gentleness and moderation that might be imitated with advantage by

civilized Europe, which has long laid claim to the sole possession of these attributes.

"The Caffres possess immense herds of black cattle, from the produce of which they derive the main part of their subsistence. On our expedition to the Quagga's Plain, we fell in with several parties of them passing from one kraal to another. They indulged us with a taste of their sour milk, of which, though I, for one, gulped down a considerable draught, I was not much delighted with the flavour. They preserve it in leathern bags; and as these extraordinary vessels are never scalded, and but seldom emptied, the fermentation constantly going on within them partakes more of the putrefactive than of the acetous. In the art of cookery, the Caffres are about as far advanced as Homer's heroes were at the siege of Troy: they broil their beef-steak and carve it with the *Assagay*, holding one end in the left hand, and the other between their teeth. They never use salt; but it is alleged, that in lieu of it, they roll the steak in cow-dung before it is broiled. Notwithstanding high authority for the existence of a similar practice, I could not help doubting its prevalence in this country: the more so, as I never observed any of our visitors making use of this singular condiment; and I enquired of several persons who had seen their manner of feeding in their own country, who invariably asserted the contrary.

"The Caffres practise circumcision, but how the ceremony came to be adopted in such a remote corner of the world, it would be almost idle even to guess; though a late intelligent traveller has endeavoured to trace it to the coasting voyage of a tribe of Bedouins from the deserts of Arabia. The same author has detected, in the Boschmen, the genuine descendants of the Pigmies, expelled by the Cranes from the banks of the Nile; and he has been equally felicitous in clearing up the genealogy of the Hottentot race, which he unhesitatingly identifies with the Chinese. The early migrations of the human race have afforded ample scope for antiquarian dispute; and much learning has been fruitlessly expended in elucidating what must remain for ever obscure."

Returning to the Cape from Algoa Bay, the 72d sailed from thence for the reduction of the Isle of France, in October, 1810; and the account of that Island we shall relate in Capt. Carmichael's own words.

"At the time that the expedition against the Isle of France was projected by our Indian Government, it was judged necessary to apply for a reinforcement of troops from the Cape of Good Hope, to co-operate in the undertaking. At the same time that this requisition was made, it was intimated that ships should be despatched from India to convey to the rendezvous at Roderigues such troops as could be spared from the settlement. The 72d and 87th regiments, with a company of the Royal Artillery, were selected for this service by General Gray, and all the necessary arrangements made to embark as soon as the transports should arrive. We marched to Simonstown, and embarked on the 22d September, 1810, and the 25th was fixed on for our departure. In the meantime, however, a vessel arrived from Bourbon with intelligence of the disastrous affair at the Ile de la Passe, and the consequent transfer of the sovereignty of those seas into the hands of the enemy. Under these circumstances, the Governor judged it prudent to defer the departure of the troops until the accession of a naval force sufficiently strong to escort us in safety. In about a fortnight, the Phœbe frigate, and the Actæon gun-brig arrived at the Cape; but this force being still thought inadequate, it was proposed, as an additional security, to arm the transports. In another fortnight, upwards of one hundred pieces of cannon were on board the three Country ships; and as the troops had been constantly trained to the great-gun exercise, we had good reason to hope that we should prove no easy conquest. All this settled, we left Simon's Bay on the 24th October, elated with the sanguine expectation that for us was reserved the honour of re-establishing the British supremacy where it had been so awkwardly lost.

"The term 'voyage' instinctively suggests the idea of a journal. Whether it be from observing the regularity and minuteness with which every occurrence is registered in

the log-book: whether merely from a wish to beguile a tedious hour; or from the pleasure in perspective of recounting the wonders he has seen, or the perils he has passed through: whatever may be the cause, no sooner does a landsman set his foot on board ship, than he runs mechanically to his writing-desk. For my own part, I must plead as guilty as most people to this charge. The present was to be my fourth voyage of some length. On all former occasions, I invariably commenced a journal of 'notable occurrences,' but as invariably gave it up before the voyage was half accomplished; having found, that unless I borrowed largely from my imagination, I was likely to cover very little paper. Materials for interesting narrative are but sparingly scattered over the face of the deep,

'Apparent rari nantes in gurgite vasto.'

Convinced of this truth by so many abortive attempts, I gave up all idea of journalizing during the present voyage, and reserved my pen for a period when subjects for remark might become more abundant.

"After a voyage which our anxiety rendered more than usually tedious, we made the object of our destination on the 2d December, and cast anchor, late in the evening, in the channel between the Coin de Mine,* and the main land. Here we found the India fleet at anchor, and learned, to our extreme mortification, that the army had effected a landing two days before, and was by this time advanced within a few miles of Port-Louis. Early on the morning of the 3d, the fleet weighed, and under the influence of a gentle breeze off the land, glided slowly towards the Baie de Tombeau, where we again dropped anchor. In sailing along the coast, we were delighted with the scenery which opened successively to our view, so very different from what we had

"* In the mention of this Islet, I cannot help adverting to the ludicrous blunder of the translator of Bory de St. Vincent's Travels, who has rendered it 'the corner of mine,' instead of 'the Gunner's Quoin.'"

recently quitted. The low ground, for several miles inland, was covered with trees of varied foliage, enclosing fields of maize, manioc, and sugar-cane, and garnished with clumps of cocoa and date palms, waving their pensile fronds over the general level of the wood. The interior presented to the eye a broken range of mountains, covered with lofty trees, and shooting up into rugged peaks, which, obscured from time to time by the passing clouds, gave the whole scene a most picturesque effect.

"As we approached within sight of Port-Louis, we observed the white flag waving over the batteries that guard the entrance of the harbour, which led us to conjecture that some negociation was going on between the contending parties; and we learned by our first communication with the shore, that the enemy had capitulated about two o'clock that morning. The terms of this capitulation are sufficiently well known, and I shall offer no remark on them. Amongst the troops they excited but one sentiment, and that not very flattering to the parties concerned. With an army of 16,000 regular, well-disciplined troops, opposed to a handful of men, not one-tenth its numerical force, and of these one-half consisting of seamen and deserters, we might, without any charge of presumption, have looked for an unconditional surrender.

"The harbour of Port-Louis is situated in lat. 20° 9″ south, and 57° 29″ east longitude. It is of considerable size. There were at least one hundred sail of various descriptions at anchor within the boom at the time we disembarked, which did not take place until the 10th December, after matters had been arranged for the embarkation of those troops which were to return to India.

"Towards the sea, the defences of Port-Louis are extremely formidable. On the left hand, as you enter the harbour, stands the Ile aux Tonneliers, about half a mile in length, and rising no higher than a few feet above the level of the water. It is merely a bank of coral thrown up by the waves, and reduced by attrition to a pulverulent state. Two batteries, erected at the extreme points of the island, are connected by a stone parapet *en crenillaire*. The west

battery, or that which stands nearest the passage into the harbour, consists of a loose embankment of madrepore, and mounts upwards of thirty pieces of ordnance (thirty-six pounders) on traversing-carriages; and on its right flank is a battery of six thirteen-inch mortars. Fort-Blanc, on the opposite side of the entrance, and at the distance of about five hundred yards, is equally well provided. If to these we add the boom already mentioned, and an easterly wind constantly blowing out of the harbour, we may regard the success of any naval attack on Port-Louis as extremely doubtful.

"A person who shall arrive at Port-Louis directly from Capetown will be tempted to draw a comparison not very favourable to the capital of Mauritius. The contrast is indeed obvious. The houses in Port-Louis rarely consist of more than one floor, and are constructed of wood. The planks, rough from the saw-pit, are laid horizontally, with their edges over-lapping, and nailed to the frame-work. The roofs are covered with shingles, which, in the course of a season, become of a greyish-black colour. The walls are painted with yellow-ochre, or left without any colouring; in the latter case, they soon assume the same dismal hue as the roof. Each house is surrounded with a clumsy palisade, and retires a few fathoms from the street. The latter are generally straight, but very narrow, and for the most part merely traced, without any attempt having been made to pave, gravel, or clear them of the stones with which they are copiously encumbered. The police, so far as regards the cleanness of the town, appears to have been much neglected before our arrival; nor is there any material reform in that particular to be expected in a hurry. The consequence is, that in passing along the less frequented streets a person must keep a sharp look-out; otherwise he will stand a good chance of stepping over the ankles into something that ought not to be there.

"Port-Louis is situated, like Capetown, in a valley, surrounded on three sides by mountains. The valley is divided by a small stream into two equal parts; that on the left side, called the Champ de Lort, is planted with a grove of *Acacia*

trees. The opposite division has, from a vain and puerile affectation of republican names, been styled the Champ de Mars; and is dedicated to the same purposes as its ancient prototype.

" The town is flanked on both sides by lines. That on the left runs down from the rocky base of the Montagne de découverte as far as the road to Moka: and the plain from that point to Fort-Blanc, is defended by three redoubts which support each other. On the east flank, a strong line extends from the Fanfaron battery across the road to Pampelmousse, and terminates in a small redoubt on the crest of one of the ridges that branch out from the Pouce Mountain. It is, however, but fair to add, that these lines and redoubts are in a state of complete dilapidation. The admirable finesse of the enemy was never more clearly displayed than in contriving to spread abroad such exaggerated statements of the strength and resources of this island; and could be matched only by the indolence or apathy of our Government that gave implicit credit to these reports, and acted on them, without having taken any previous steps to verify them. It was an amusing spectacle to the citizens of Port-Louis, who crowded down to the shore to see whole ship-loads of pioneers' tools, and scaling-ladders, landed from the fleet after the town had surrendered. Scaling-ladders to storm an open town! And the measure of our follies would not be complete, unless we had made this public display of them. I heard it seriously disputed, at the table of one of our officers of rank, whether with the force destined for this expedition we should be able to take the island. It was our host's opinion that if we did succeed, it would cost us a thousand men at the least. Our actual loss amounted to about fifty, and the greater part of it was the result of a panic among our own troops the night before the town surrendered.

" It was in the lonely and secluded recess formed by two branches of the Pouce Mountain behind Port-Louis, that St. Pierre laid the scene of his interesting story of ' Paul and Virginia.' Contrary, however, to his most solemn affirmation, the Colonists deny that the beings ever existed whose mis-

fortunes gave birth to that affecting tale. Most willingly indeed would they deny the existence of the author himself, if we may judge from the eagerness with which they retail the grossest calumnies against his moral character. A man labours under peculiar disadvantages, who, like St. Pierre, publishes an account of a confined spot, such as the Isle of France. If he ventures to give the slightest sketch of manners, or deviates into anecdote, he is sure to offend. Where all the members of a community are mutually known, every awkward fact made public has instantly its application. Eulogy itself, when dispensed under such circumstances, changes its character and becomes satire. Praise bestowed on a near neighbour seems as if it was within a short space of falling to our own share, and our mortification at missing it is proportionally severe. We feel somewhat like the man in the lottery, who has drawn the next number to the capital prize.

"The description of a country usually receives its colouring from the natural disposition or actual state of mind of the describer. As all objects appear 'yellow to the jaundiced eye,' so every thing with him is tinged by the prejudice through which he views it. Hence it is that sentimental travellers are not to be literally understood when they deal out censure any more than when they bestow praise. St. Pierre experienced some vexations during his residence in Mauritius, which disgusted him with the country as well as with the inhabitants. The men, accordingly, are all rogues, the women jades, and the island a loathsome receptacle for slaves and felons. On his way home, he received some civilities at the Cape of Good Hope, and in the barren sands of Africa he sees nothing but verdant meadows; in the half-savage boors, worthy representatives of the Arcadians of the Golden Age. He asserts, as matter of reproach, that the trees in Mauritius are covered with a grey pellicle instead of bark. Had he travelled as a tanner, such a circumstance would have furnished reasonable grounds for bad humour; but to a philosopher it should afford only an additional motive for admiring the various means by which nature contrives to attain her

ends. He says that the foliage is of a dirty-green colour. There are those, however, who would dispute this point with him, and maintain, on the contrary, that tropical scenery exhibits a greater variety of tints than that of temperate regions. The foliage of all trees becomes darker the longer it stands; and as the young leaves are pushing off the old throughout the year, there is a constant variety of shades, from a glowing yellow or purple, to a dark green. This is the beautiful in landscape, so far as depends on foliage. The Europæan partakes more of the sublime. The periodical decay of the whole vegetable world impresses the mind with a sentiment of melancholy; and would be felt by a native of a tropical climate, on seeing it for the first time, with somewhat of the same sensation as if he had passed over a country whose population had been swept off by a pestilence.

"Port-Louis appears to be the outline of an extensive and magnificent plan, commenced in a hurry, and relinquished with precipitation. Spacious magazines, the foundation of which is built of stone, the superstructure of wood;—strong batteries for the protection of the town, without any accommodation for troops to defend them;—lines of defence, in some parts twenty feet high, and rivetted with hewn stone, in others a mere earthen embankment, incompetent to check either men or cattle;—a piece of ground enclosed for barracks, where eight or ten thousand troops might be accommodated, but which barely serves to lodge a couple of regiments;—an hospital for the reception of several hundred patients;—the foundation, in cut stone, of an extensive encampment for Government slaves, but never covered in;—a foundry for casting cannon;—a mill for manufacturing gunpowder;—cast-iron pipes for transmitting water from the distance of two miles to the town, but never put to use;—a spacious cathedral half finished, and now in ruins;—a lyceum without either masters or pupils;—an extensive botanical garden, for rearing and distributing the useful and ornamental exotics of tropical climates, but which has degenerated into a spice-plantation for the emolument of the gardener. Such are

some of the indications which would lead us to conjecture that this island was at one period intended for a grand depôt.

"From the long and rigorous blockade which the island had sustained, and its supposed incompetency to supply the demands of its population, it was expected that the inhabitants must be reduced to the utmost distress. We were encouraged even to believe that famine would shortly urge them to make a voluntary surrender of the island; and our blockading squadron are accused, I am sorry to say, of having used to that effect certain accelerative measures hardly to be reconciled with the rules of honourable warfare: firing at canoes fishing within the reefs; at the slaves engaged in the cultivation of the soil; and at the herds of cattle pasturing along the shore. Such acts, of which I entertain, however, the strongest doubts, savour too much of wantonness and revenge. To the enemy they could be productive of no material injury, and would serve only to foster in their breasts a sentiment of inveterate hostility to the British nation.

"Though by our attack on the island, its voluntary surrender, if such a measure was ever in contemplation, was anticipated; yet in faithful reliance on the reports of our naval commanders, we expected to meet on our landing with a set of half-starved, extenuated wretches, crawling about in the last stage of existence. Guess therefore our astonishment on finding ourselves surrounded with a stout, healthy, athletic race, firm on their limbs, and so far from displaying any of the usual symptoms of famine, that we could remark among them divers individuals whose rotundity of carcase would do honour to a corporation of aldermen. We found beef and mutton (*alias* goat) rather dear, but by no means scarce; and all other articles in profusion: the shops full of English merchandise, selling at nearly the London prices.

"The Isle of France was discovered by Portuguese navigators in the year 1505. They found it without inhabitants,* and covered with an impenetrable forest. Such

"* I do not recollect, in the history of naval discoveries, another instance of

a spot offered no allurement to a people impelled, as they at that period were, by the demon of conquest and conversion. They contented themselves, therefore, with turning loose into the woods a few domestic animals, such as deer, goats, and hogs; then forsook it for ever.

"Ninety years after the period of its discovery, the Dutch took possession of the island, and gave it the name of Mauritius. These republicans, however, equally ambitious as the Portuguese had been a century before, were at this time pursuing the latter in all quarters, and wresting from them their most valuable possessions in the east. The infant Colony was thus left totally neglected; and feebly protracted its existence in languor and obscurity until the year 1712, when it was removed to the Cape of Good Hope. The French, who had a considerable settlement at this time on the Island of Bourbon, no sooner learned that the Hollanders had abandoned Mauritius, than they sent a detachment to take possession of it in the name of His Most Christian Majesty. Such was the origin of a Colony, which, at this day amounts to eighty thousand souls.

"The extreme length of Mauritius, from Cape Malheureux to Cape Brabant, is about forty miles; and its greatest breadth, from Port-Louis to the Grand Port, thirty miles. Its surface is broken by mountains, some detached, others forming chains of considerable extent. These appear much loftier when viewed from the coast than from the interior of the island, as the land rises to a great height in the centre, equalling in that respect, some of the mountains themselves. The elevation of the latter is but moderate; the Piton de la Rivière Noire, the highest in the whole island, measuring no more than 2544 feet above the level of the sea. Piton du bras is 24 feet lower; and the Pouce, 48 feet. What is termed the plain, or level ground, rises perceptibly as you recede from the

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an island equal in size to either Mauritius or Bourbon having been found, like these islands, uninhabited. As they lie within a few days' sail of Madagascar, which always maintained a communication with the coast of Africa, the circumstance furnishes an argument in favour of their more recent formation, and against the supposed early navigation of the Chinese in these seas."

coast, and in the centre of the island, is not less than 1500 feet high.

"The whole island appears to be one solid mass of *trap.* There is no variety. The rock is of a bluish colour in the recent fracture, and thickly interspersed with crystals of *olivine.* The rolled fragments, when broken, sometimes exhibit drusy cavities lined with *zeolite.* The mountain-masses are disposed in thick strata, or beds, forming a considerable angle with the horizon. Even the loose fragments, where they have not been displaced by the operations of agriculture, are often arranged with surprising regularity; and we can trace in them an approximation to the prismatic figure. Their upper and lower sides are flat, and the circumference of from three to six, but generally five, faces. In some parts of the island, we meet with tesselated patches, a quarter of a mile in extent, consisting of a smooth sheet of rock, cracked into these prismatic fragments, and so nicely adjusted to each other, that room is barely left for a line of verdure in the fissures to mark their division.

"In the faces of the deep ravines through which most of the rivers have worked their channels, the rocks occasionally display the columnar form of *basalt:* exhibiting both the perpendicular and the horizontal section, as well as the angles of the columns. In other parts, where this regularity does not prevail, we may observe the prismatic masses lying over each other, but separated by the intervention of a layer of earth, the product, apparently, of their own decomposition. In the same manner they stretch out into the sea on every side of the island, giving a solid base to those coralline fabrications which are generally believed to compose the whole reef; though it is more probable, that they only form the superficial crust.

"The soil of Mauritius is a tenacious earth of a ferruginous colour, mixed with a very small proportion of vegetable mould. In the dry season, it becomes extremely hard, and cracks into numerous fissures. In some parts of the island, it is sufficiently plastic to admit of being manufactured into a sort of bottles called *Gargoulettes,* which possess the inestimable quality of preserving water, at a temperature

many degrees lower than that of the surrounding atmosphere. These vessels are made very thin, and without any glazing. They are accordingly so porous, that when filled with water, it transudes in sufficient quantity to keep the surface constantly wet; and when thus exposed to a current of air, the evaporation from the outside maintains the contents of the vessel in a state of refreshing coolness.

" The whole of this soil appears to have been formed by the decomposition of the *trap.* In some parts, this transmutation is already nearly completed; for, on penetrating to any depth in the ground, we find nothing but a mass of reddish earth, with here and there a small nucleus of stone, enveloped in concentric crusts of matter, in an intermediate state between that and soft earth. In other parts, however, and those the more numerous, where the greater compactness of the *trap*, or some other cause, has retarded the process of disintegration, we meet with little or no earth, but with angular masses of stone without any crust.

" Various French Naturalists who had occasion to examine the structure of this island, have given it as their opinion, that it is entirely of volcanic origin; and if the description of rocks known by the name of *trap* is proved to be a product of fire, no spot upon the face of the globe has a fairer claim to that origin: yet the attentive mineralogist will stumble upon objects, the existence of which he will find it difficult to reconcile with any theory which would attempt to account for its formation, on the level, at least, where it actually lies.

" On the plain, for instance, that spreads out from the base of the Tamarind Mountain, there is a mass of petrified coral, about twelve feet high, and forty yards in circumference, very little sunk in the ground, and appearing as if it had been dropped there by accident. It is disposed in three distinct beds; the lowest divested of every trace of organization, and so indurated, that, on being struck, it gives a metallic sound; the others still retaining their organic structure, though several blocks of the common *trap* of the island are seen imbedded in their substance. The ground

on which this mass reposes is far above the level to which the coralline exuviæ have been thrown up by the hurricane. If he pursues his way till he passes the isthmus that connects the Morne de Brabant with the main land, and then turns to the left, he will have to travel over a ledge of coral rock, a mile perhaps in length, and in some parts not less than sixty feet in thickness. It is of the same structure as that already described, and nearly insulated by a salt-marsh into which the sea flows at every spring-tide. This bank terminates at the Baie du Cap, and in the charts of the island is called Point de Corail. At Port Jacoté, close by the signal-post, there is a mass of coral, bearing the same characters as the former, one hundred yards at least in diameter, and nearly as many above the level of the sea.

" At the Grand Port, there are numerous examples of the same kind. The Ile des Aigrettes, three miles in circumference, and lying a great way within the verge of the reef, consists entirely of petrified coral; and though quite destitute of soil, is covered with an impenetrable coppice. The Islets Marianne, Vacois, Fouquet, and de la Passe, are of similar structure, and also Monkey-Island, at the bottom of the bay. The beds of the Ile de la Passe recline at the angle of 45°, and the coral is so indurated as to have served the purpose of stone, in constructing the barrack and battery erected upon that island to defend the entrance of the Port. What is more extraordinary, the dip of these beds is so far from being conformable, that they incline in opposite directions, and at a right angle with each other, on the opposite sides of the island. In short, every accessory islet and rock within the verge of the reef consists of the same material, with the solitary exception of the Ile aux Fourneaux, the base of which resembles that of the main island.

" Such being the fact, it remains to be accounted for, how these masses came to be placed in their actual situation. The agency of hurricanes is out of the question in discussing the existence of marine exuviæ at a greater elevation than fifteen or twenty feet above the ordinary reach of the sea; and their stratification, oblique in some cases, and their total want

of connection, excepting that of superposition, with the subjacent rock, give them quite the appearance of extraneous bodies, projected by some unknown cause on the spots where they now repose.

" There are two theories, on the principles of which the geologists of the present day profess to explain the actual state of the earth's surface; the advocates of one theory maintaining that the dry land was elevated from the bottom of the sea by the expansive force of heat acting from below; while the votaries of the other assert that the land was formed where it actually exists, and was left dry by the gradual recession of the sea within its present limits, after having, for a long period, covered the highest mountains. Without venturing an opinion on the comparative merits of these theories, as applied to the surface of the globe in general, there are certain facts connected with the Natural History of this island, as well as of Bourbon, that appear to me less repugnant to the principles of the former, than to those of the latter; and for the explanation of which, I would not hesitate to give it the preference, if I were called on to choose between the two.

" Their deep narrow ravines, and high precipitous mountains; the vast accumulation of angular fragments of a description of rock that appears peculiarly prone to disintegration; the almost total want of vegetable soil on their surface, and of alluvium along their shores; the remains, already noticed, of a belt of organic exuviæ reposing on the surface of the ground, though apparently similar to those which are found in other parts of the world, buried deep within the bowels of the earth: these, and their uninhabited state at the era of their discovery, are points which favour, so far as they go, the supposition, that the islands in question are of comparatively recent origin. Now, partial and successive formations of land are conceivable on the principles of the Huttonian theory. The elevation of the whole, indeed, of the present dry land, may be considered as the result of a partial exertion of that power, which, according to that theory, is in constant activity in the central region

of the globe. Such formations are, on the other hand, utterly irreconcileable with the Wernerian theory. The retreat of the universal water must have taken place simultaneously over the whole surface of the earth. No one portion of land can therefore be accounted more ancient or more recent than another; except in so far as the tops of the mountains, being the first left dry, may lay claim to a priority of existence.

"The Isle of France is surrounded almost throughout with a coral reef, the continuity of which is nowhere broken but at the harbours and the mouths of the rivers. This reef varies greatly in diameter, forming in some parts merely a narrow border, while in others it expands to the breadth of a mile and upwards. Its surface is in general quite level, but here and there intersected by narrow channels, wherein an infinite variety of small fish, the tenants of the reef, take refuge during the reflux of the tide. The extreme edge is invariably the shallowest part, and seems as if designedly raised as a bulwark against the encroachment of the sea, which breaks over it with a prodigious roll. Beyond this barrier, the bottom slopes like a glacis, and soon sinks out of view. Looking over the reef from an elevated station, we can trace the windings of the channels that traverse it by the varying colour of the water. In the deepest parts it is of a bluish tint; in two or three fathoms this colour passes to green, which becomes paler in proportion as the depth diminishes. From the top of the Pouce Mountain we have a bird's-eye view of almost the whole island, with its pale-green border, veined with blue, and fringed with the foam of the everlasting surge. Beyond this bright zone, the indigo colour of the ocean deepens on the view until lost in the aerial tints of the horizon.

"I have already hinted my suspicion that the strong fabrics known by the name of *Coral-reefs*, are not reared up from the depths of the ocean, as is generally believed; but that they are little more than mere incrustations growing on a base of solid rock, at the depth of a few fathoms beneath the surface. But as this is a point that lies beyond the reach of actual

demonstration, all that I have to offer in support of my opinion are arguments founded on probability and analogy.

"If we may judge from the form and structure of the coralline productions, the number of species endowed with the power of fabricating them must be very considerable. All of them agree, however, in one respect; they commence their work at a central point, and extend it in all directions indiscriminately. The law which governs the operations of an individual or a family in this respect, is no doubt equally operative on the whole society; and the aggregate ought to exhibit, on reaching the surface, a reef of a circular form, and coextensive at least with the base whereon it rests. But *Coral-reefs* rarely exhibit this form, or any other that can be easily defined. Their forms are usually the most irregular that can be imagined; such, indeed, as can only be attributed to a corresponding irregularity in the base on which they are reared.

"The coral-worms build perpendicularly, and only on a fixed solid foundation. This is well exemplified in the Island of Bourbon; where a deep, precipitous, rocky coast on one side, and on the other, a shelving shore of water-worn pebbles, have hitherto prevented the establishment of these fabrics. The fact, too, that harbours and the mouths of rivers in tropical regions are invariably clear of living coral, though liable to be choked up with its débris, is illustrative of the same principle.

"If the *Coral-reefs* were built up from the bottom of the sea, how are we to account for the partial manner in which they are distributed? The shores of intertropical continents and islands are generally fringed with them; and we find them running in interrupted chains from one groupe of islands to another, in the same manner as submarine rocks are known to do in those parts of the sea that lie beyond the range of the coral-worms; but the ocean at large, is, as far as we know, entirely clear of them.

"Detached reefs are sometimes met with, of very small superficial extent, one hundred yards, or perhaps less. Are we to believe that a columnar mass of such fragile materials,

reared up from the depth of one, two, or three, not to say ten miles, should be able to withstand the impetus of the tides and currents?

"The surface of our globe has been explored, from the verge of the ocean, to its highest pinnacle. In this space, the most elevated point hardly exceeds the perpendicular height of four miles. Yet so great is the difference in the temperature and density of the atmosphere, that the animals which flourish in the lower regions, cannot exist in the upper; nor can those whose organization is framed for living in the upper regions, exist in the lower; while the highest region of all is utterly unfit to support either animal or vegetable life.

"The mean depth of the ocean, as calculated by La Place, (Mec. celeste,) is four leagues, bearing to the altitude of the highest land a ratio of three to one. Is it not extremely probable, that at this vast depth the pressure of the aqueous fluid is so great as to prove absolutely inconsistent with animal life? Or may it not, at all events, be safely maintained, that if there are animals whose organization enables them to live at such a depth, that organization will disqualify them for existing at the surface? It is well known that a fish, hauled up from the depth of only one or two hundred fathoms, is rendered incapable of performing its usual functions by the time it arrives at the surface, owing to the diminution of external pressure on its body; one effect of which is to distend its air-bladder so as to protrude into its throat. How much more must a transition, however gradual, from the extreme depths of the ocean to its surface, derange the functions of life?

"The opinion, therefore, that the coral-worms are constantly at work laying the foundation of islands and continents at the bottom of the sea, and rearing them up to the surface, appears to me more than questionable. That they contribute to the formation of land when they find a base near the surface, on which they may commence their work, will not be denied; yet, as they cannot build higher than the reach of the tide, it is to the winds and the waves,

accumulating and casting up the wreck of their works, that even this effect ought properly to be attributed. This is the only way in which the land appears to be gaining on the sea, by the labours of these diminutive animals; and in this way some addition has already been made to Mauritius. It will continue to extend its limits in the same manner until the shallows within the border of the reef are elevated above the high-water mark; but there the accession of territory will most probably terminate.

"When the 72d regiment occupied the outposts of the island, I was quartered for some months at the cantonment of the Rivière Noire, where I had ample scope for my favourite pursuits. The country round this post presents to the eye every thing that is grand and picturesque in tropical scenery. Directly behind it the Tamarind Mountain rises in the form of a cone, surmounted by a flag-staff for repeating signals. The river glides through a mass of mountains covered with wood, the shoulders of which, pushed one behind the other into view, lengthen the perspective to an indefinite extent. In the foreground, a variety of tropical trees, such as the *Cocoa* and *Date-palms*, the *Mango*, the *Tamarind*, the *Breadfruit*, and *Acacia*, scattered in agreeable confusion, permit a transient glance at fields of *Cotton*, *Manioc*, and *Sugar-cane*, with herds of Madagascar cattle pasturing on the lawn. A numerous flotilla of coasting schooners charged with the produce of the district, and of fishing canoes plying in all directions, give a peculiar animation to the scene, which is still farther enlivened by the cry of the hounds, echoed from the hills, while they pursue the deer, and chase them into the sea through the midst of the cantonment.

"The mouth of the Rivière Noire affords safe anchorage for a few ships of large size, and troops may be disembarked without difficulty. It is, on this account, considered one of the most important posts in the whole island; and the approach to it is strongly guarded. On the east side, the battery Lapreneuse, of six pieces of heavy artillery, is erected on the most prominent point of the coast; about

six hundred yards farther back is another of three guns; and one of two guns flanks the cantonment; on the opposite side of the anchorage is the battery of La Harmonie, of twelve guns, by which a heavy cross-fire can be maintained with that of Lapreneuse. At the former, a barrack has been erected for the accommodation of one hundred men.

"As soon as our arrangements were completed at the post, I made an excursion, in company with Colonel Leitch and Captain Rutherford, to the district of the Savanne. On our way thither, we slept the two first nights at the plantation of M. Chazal de Chamarel. This property is one of the most extensive and most fertile in the island. Situated at a great elevation, it never experiences those scorching heats and protracted droughts that give a check to vegetation for a great part of the year along the coast. Embosomed in the forest, and surrounded by some of the highest peaks in the island, it enjoys a perpetual succession of refreshing showers, and is shaded by a thick canopy of clouds that moderate the temperature of the air. The humidity, however, consequent on this state of atmosphere, has a pernicious effect on the health of his slaves, which he finds it necessary to counteract by warmer clothing and less intense labour. Transported hither from the burning regions of Mosambique and Madagascar, the 'green slaves' are speedily attacked with pulmonary diseases, which, when they do not prove fatal, degenerate into chronic disorders that render them unfit for any sort of sustained labour.

"All agricultural labour is performed by slaves; and the only implements used are the hoe and the dibble. With the former they prepare the soil and keep it clear of weeds. All sorts of pulse and grain are planted with the latter. The ground is, for the most part, so much encumbered with stones, that neither the plough nor the harrow can ever be used with advantage. The labour of the slaves, however, from its very multiplicity, is neither so constant nor so systematically conducted as in our West India Islands; but the unfortunate facility of procuring fresh supplies, has hitherto more than balanced this advantage,

by rendering the health of the slave an object of less importance in the eyes of his master. The severest part of their labour is transporting the produce of the soil, either to places of embarkation on the coast, or to Port-Louis direct. This produce, whether it be sugar, coffee, cloves, or grain, is packed up in bags weighing about one cwt. The usual practice is to charge the slave with one of these bags, which he carries on his head, going in a sort of trot, and resting occasionally to draw breath. On the plantations adjacent to Port-Louis, they sometimes employ for this purpose an unwieldy sort of cart with immense wheels, which is dragged into the town by a string of thirty or forty slaves, harnessed and yoked to it like so many draught cattle. It is to be hoped, however, that this painful and degrading branch of labour will shortly be abolished. Since the British obtained possession of the Island, considerable attention has been paid to the state of the roads, and the communication with the capital rendered less difficult. A traffic has been established with the Island of Madagascar, which gives constant employment to several vessels in importing cattle for the use of the troops, and for such of the planters as choose to purchase them. This traffic has, in less than two years' time, reduced the market price of beef from 2*s.* 6*d.* to 1*s.* per pound. There is hardly a plantation on the island on which there is not a considerable portion of waste land, unfit for tillage. These are now converted into pastures, and herds of black cattle are multiplying in every quarter. The example of a few enterprising planters, who have already begun to train these animals to the draught, will speedily open the eyes of the rest to their own interest, and induce them to transfer the harness from the slaves to their oxen.

"As a specific against the pectoral disorders to which I have alluded, and to which the whites fall sometimes victims as well as the blacks, some patriotic individual introduced the old empirical remedy, *Snails.* Here these animals have thriven exceedingly, and multiplied so much faster than the demand for them required, that they are

now become an offensive nuisance. They have, moreover, so far lost their reputation as a medicine, that they have been transferred by the faculty from the column of therapeutics to that of dietetics, and are, in this latter quality, collected on many of the plantations to feed the hogs.

"Chamarel's house, like almost every other in the island, is constructed of timber. The general predilection for this material has arisen from the abundant supplies of it in the vicinity of every plantation; from the portion of labour which must, at all events, be employed in felling it to clear the ground; and from the expertness in fashioning it, which is acquired by many of the slaves in the prosecution of this labour. The time, however, is fast approaching, when they must have recourse to more durable materials. The diminution of the forest from the rapid extension of cultivation, will shortly render the use of stone a matter of economy as well as of necessity. For this purpose, the *trap-rock* of the Island is admirably adapted; and every part of the coast yields the very best material for making lime.

"The houses, in general, are built on a scale adapted merely to accommodate the family. Pavilions, for the use of strangers and casual visitors, are erected at a short distance from the main building; and the back ground is occupied by the slave cantonment. With the turn for improvement which the French are known to possess, it is a matter of surprise, that these islanders never surround their houses with verandahs, nor is it a common practice even to plant trees near enough to shelter them from the sun. The environs, however, are usually planted with groves and avenues of ornamental trees, chiefly *Mango, Tamarind*, and *Acacia,* intermingled with the *Cocoa* and *Date-palms;* but above all, conspicuous, is the elegant *Badamier* (*Terminalia Catappa.*) The branches of this superb tree issue from the trunk in whorls, long, slender, and perfectly horizontal. Seven, eight, or more stages of similar configuration, but diminishing regularly according to their height, give it the appearance of an inverted

cone, or rather of that useful piece of furniture called a dumb-waiter, and its foliage is, at the same time, so copious, that not a ray can touch those who repose under its shade.

"Our first excursion from Chamarel's was to the Grand Cascade or waterfall, about half a mile from the house, considered by the creoles as the eighth wonder of the world. They assign to it the height of 750 feet. It may be reckoned fully 500 feet. The fall is perfectly uninterrupted, the water never touching from the time it pours over the edge of the rock until it falls into the basin below. During summer the stream is scanty, and a great part of it is dissipated in its fall; but in the rainy season, and after one of those torrents that occasionally inundate the island, this cataract must be a tremendous object indeed.

"The chief produce of the plantation is *Coffee*. This is the seed of the *Coffea arabica* of Botanists. The berry is about the size of an acorn, of a scarlet colour, and sweetish taste, combined with a little of the coffee flavour. These berries are picked off as they become ripe, and exposed to the sun until the pulp is changed to a dry, brittle husk; then beaten in wooden mortars to disengage the seeds, of which each berry generally contains two. The grains are carefully examined, and such as have the slightest flaw or bit of crust, rejected or thrown back into the mortar. The coffee, thus prepared, is packed up in bags made of the leaves of the *Vacois*, (*Pandanus Vacqua*,) and stored for the market. The coffee-shrubs are set in rows at the distance of six feet asunder; and are not suffered to grow up beyond the reach of the hand. One slave can manage a thousand plants, which yield, on an average, as many pounds of coffee. The average duration of the shrub is seven years, during four of which it yields fruit.

"The estate yields also a considerable return in *Cloves;* but they are neither so large nor so high-flavoured as those produced on the low-grounds. It is probable that this tree, being a native of the Molucca Islands, requires a higher temperature to perfect its fruit than that of Chamarel's plantation. The *Clove-tree* (*Caryophyllus aromatica*) grows to the

height of thirty feet. It is very slender, and its branches, loaded with leaves, bend downwards. The spice, so well known by the name of the *Clove*, is the flower-bud of this tree, collected before it expands into a blossom. The pericarp, seated under the flower, is club-shaped, and of a blood-red colour. The flowers are disposed in a sort of umbel at the extremity of the branches, and are gathered as soon as they show a disposition to expand. After a few days' exposure to the sun they are packed up in bags for exportation.

"For the subsistence of the slaves, a considerable portion of the ground is devoted to the culture of *Manioc*, (*Jatropha Manihot*); the stem of this shrub grows to the height of six or seven feet. The bark is of a purple colour, and studded with tubercles left by the fallen leaves. The stems selected for the reproduction of the plant are cut into junks, and set in the ground at the distance of four feet asunder. The lower end pushes out roots in all directions, and from the upper a new stem is gradually evolved. Each plant produces several fusiform roots resembling a carrot, but much larger. The period of growth in this plant is influenced in a remarkable degree by situation. On this plantation it arrives at maturity in fifteen or eighteen months, whereas in the low districts of the island it requires for that purpose no less than three years. *Manioc* constitutes the ordinary food of the slave population. About three pounds of the root, grated, and baked into as many cakes, is the daily fare. Whether boiled or baked under the ashes, the *Manioc* is of a much finer and more glutinous texture than either the *yam* or *potatoe*. It appears to have a greater proportion of amylaceous matter in its composition, and consequently possesses more of the nutritive principle. The soldiers were at first much prejudiced against it as an article of food; but they became insensibly reconciled to the use of it, and in the course of time preferred it to every other vegetable with their salt beef and pork.

"*Indian Corn* (*Zea Mays*) is another article of extensive cultivation on this estate, both for the use of the family and for the slaves. Ground, by the aid of a hand-mill, into a coarse meal, it is boiled and served up in the same manner as

rice. Its colour in this state is an extremely rich yellow; and it forms a palatable and nutritious article of food. This being the only sort of grain used for feeding horses, there is a constant demand for it in Port-Louis, where it usually fetches from one and a half to three dollars per cwt. When a field is planted with *Manioc*, it is the general practice to plant the intervals with *Maize;* the latter being of more rapid growth, screens the young shoots of the other from the sun. It ripens in the course of six months.

"The *Creole Rice*, as it is termed, is equal in quality to any in the world; its grain particularly large, and of a pearly whiteness. It is of the sort called 'dry rice,' which, as it does not require artificial irrigation, is peculiarly adapted for the hilly, uneven ground of this island. Chamarel showed us several fields under a crop of this grain, which promised an ample return. These fields are surrounded with rows of an elegant species of *Palm*, (*Areca lutescens*,) a native of the island. There are four species of this *Palm* indigenous to the forests of Mauritius and Bourbon, and known by the general appellation of '*Chou Palmiste*' or *Cabbage-palm*. What is termed the *Cabbage* is the rudiment of the young leaves crowning the stem, still convoluted, and sheathed by the base of the full-grown ones. When cut down, and divested of this envelope, the cabbage, or edible part, appears. It is as white as snow, and has the sweet luscious taste of the filbert. It is boiled and eaten as cabbage, or cut in shreds and mixed up raw, as a sallad. In the latter state it is peculiarly grateful. As this morsel, however, cannot be enjoyed without destroying the tree, all but the epicure will acknowledge that it is purchased at too dear a rate.

"Our communicative host informed us, in the course of conversation, that when he entered on possession of this estate, fifteen years ago, the whole of it was an impenetrable forest: and that he commenced his operations as a planter, with a young wife, three slaves, and a debt of six hundred dollars. By unremitted industry, he succeeded in clearing a large tract of ground, and the abundant returns yielded by a rich virgin soil, rendered him in a short time independent.

In the process of clearing the land, vast quantities of valuable timber were cut down, and, among the rest, whole ship-loads of *Ebony*, which were burned where they fell, as the price of timber in the market would not cover the expense of transportation. . . . .

"After breakfast, we took leave of this very hospitable family, and continued our journey; but as the path through the forest was rather intricate, Chamarel, good-naturedly undertook to guide us in person, the greater part of our way traversing his own grounds. In every field through which we passed, before we entered the wood, we observed a hut occupied by a confidential slave, who was stationed there as a check on the depredations of the maroons or runaway slaves. At each of these huts there was also cantoned a detachment of poultry, which had the range of the field, to pick up a livelihood without trouble or expense. The main dependence of the Colonists for animal food is on their poultry. Mutton is scarce, because sheep do not thrive on the rank herbage of the island. Goats are plentiful, because they are more hardy, but their flesh is a poor substitute for mutton. With regard to beef, those who live at a distance from Port-Louis rarely taste it; for unless a whole district were to subscribe for a share, no one can venture to slaughter a bullock, the heat of the climate rendering the flesh unfit for use in less than twenty-four hours. The supply of sea-fish to the families settled in the interior of the Island is altogether precarious; nor are the rivers so large or well stocked as to supply the deficiency. *Eels* of an enormous size, a species of *Gobius* about six inches long, a fish called '*Chite*,' of the size and habit of the common trout, and very fine *Shrimps*, make up the catalogue of indigenous fresh-water fishes. Many of the planters have fish-ponds, in which they breed the *Gouramy*, (*Trichopus Gouramy*,) and a large species of *Cyprinus* of a scarlet colour; both of them introduced from China, and of an exquisite flavour. These fishes feed on the leaves of the *Songe* (*Arum esculentum*), which is planted for that purpose on the margins of the ponds. Salt meat, both beef and pork, can always be procured in the market; but though

the Colonists are extravagantly fond of it in all its varieties, it never enters into their ordinary bill of fare.

"After a fatiguing walk of about three hours, we arrived at the glen which terminates in the Baie du Cap, and through which flows the river that forms the Grand Cascade. All along the rocky channel of this river we remarked regular and beautiful specimens of *columnar trap*, sometimes fluting the mural cliffs, at others forming a tesselated pavement at their base. Half a mile before we arrived at the bottom of the bay, our conductor led us a short way aside, in order to show us a remarkable natural curiosity. It is a cavern in the face of a perpendicular rock, or rather hill, about six yards in depth, and regularly vaulted over by an arch, the span of which is equal at least to twenty yards. The arch is formed by the ends of small *basaltic* columns, arranged with much symmetry, and over the front of the cavern you see the shafts of these columns diverging as they ascend, according to the strictest rules of architecture. A stream of water, which pours down from the top of the precipice, is received into a deep basin directly in front of the cavern, whence it silently glides down to the river through a grove of *Banana* and *Clove trees*. It was impossible to view this natural recess without forming visionary plans of embellishment, such as would render it a delightful retreat from the sun, which at this moment darted his rays with meridian ardour. After breathing for a few minutes the cool atmosphere of the cavern, we set off again, and arrived shortly thereafter at a precipice which we were obliged to scale, by the aid of a ladder, not less than twelve yards long. This undertaking had a nervous effect on more than one member of our party; but we accomplished it without any accident, and arrived, in about a quarter of an hour, at the residence of Mr. Blancard, where we were welcomed with the same cordiality as at Chamarel's.

"Blancard's plantation is the first we come to on entering the quarter of the Savanne. This district commences at the Baie du Cap, and thence stretches along the coast as far as the Rivière du Poste. The bay is nothing but a small creek, as indeed all the bays in this island are, where a few coasting

schooners cast anchor while they take in the produce of the adjacent plantations destined for Port-Louis. It was here that Captain Flinders took refuge with the boat in which he had effected his miraculous passage from the coast of New Holland; and here he was apprehended by order of Governor de Caen, on pretence of being a spy, and detained on the island for several years as a captive. It is but justice, however, to add, that the conduct of the Governor in this instance was very generally disapproved of by the Colonists; and that our navigator, who appears to have been a prisoner at large over the Island, experienced from them a degree of sympathetic attention which consoled him in some measure under his unmerited misfortune.

"After dinner we left Blancard's, and, having taken leave of our friendly conductor, pursued our way along the sea-shore. In a couple of hours we arrived at Porte Jacoté, garrisoned by a subaltern's detachment of the 86th regiment. A couple of two-gun batteries, one on the main-land, the other on a small adjacent island, protect this little cove and the craft which take shelter in it. An attack was, however, made on this post by the boats of the Nereid frigate, while cruising off the coast, and the Civil Commissary, a gouty old gentleman, taken prisoner after all his people had deserted him. Night was now fast approaching, and we had still a league to walk to Mr. Lousteau's place, where we proposed sleeping. It was quite dark when we arrived there, and what was still worse, our landlord was from home. We had no difficulty, however, in making our quarters good, it being a point of honour among the planters, to have the stranger at all times made welcome.

"Many of the planters have of late turned their attention to the cultivation of the *Clove;* and among these, M. Losteau appears to be among the most enterprising. A great part of his estate is laid out in plantations of this valuable spice; and he has added in no small degree to its beauty, by bordering the fields with rows of the elegant *Filao,* (*Casuarina equisetifolia.*) This tree, which is a native of Madagascar, bears a striking resemblance to the *Larch;*

and the sighing murmur of the breeze through its filiform leaves, excites a most agreeable sensation.

"Our next day's journey was only an hour's walk to M. Mounerou's residence at Port-Souillac, a small inlet at the mouth of the Rivière de la Savanne, and one of the safest harbours in the island for coasters. It is defended by a battery of three guns, erected on a commanding position on the left side of the entrance. At this point, the *Coral-reef* ceases, and the sea comes rolling in to the base of the rock, breaking over it with a tremendous surge. From this cove to the Pointe du Souffleur, a distance of sixteen miles, the shore is equally abrupt, deep, and void of coral; a fact which I regard as corroborating the opinion I have already hazarded on the nature of the coralline insects.

"This estate possesses the most complete establishment in the island for the preparation of sugar. It is constructed on the same principle as those of our West India estates, but with the addition of refining apparatus. The sugar mill is composed of three perpendicular rollers, sheathed with plates of metal. The central roller is connected with a large wheel, which is turned by water. All the rollers are indented on the upper edge, and the central one turns the others, each on its proper pivot. The canes are presented between the central and the right-hand roller, the rotatory motion of which being inwards, the cane is drawn in and deprived of the greater part of its juice. A simple contrivance on the opposite side directs the half-pressed canes round the middle roller, and returns it between that and the left roller, which, being more contiguous to it, the canes, in their passage, undergo a thorough pressure, and are ejected entirely deprived of their juice. The juice is collected in a reservoir surrounding the base of the rollers, and thence conveyed by a small trough into the boilers, where it is boiled with a slight addition of quick-lime, and the impurities carefully removed as they rise. As soon as it has acquired the consistence of syrup, it is poured into shallow vessels, where the sugar granulates as the liquor cools. The sugar is then removed into conical earthen

vessels, perforated at the bottom with a number of small holes, through which the molasses gradually drain off. After remaining in these vessels until thoroughly dry, the sugar is packed up in bags for the market.

"The cultivation of the sugar-cane is very simple. Cuttings of the stem are laid in the ground in parallel furrows, then covered over with earth. In a short time, young plants shoot up from the joints. The ground is kept well weeded, and in the course of twelve months, the crop is ready for cutting. On many estates, however, perhaps on the greater number, instead of planting the cane in this manner, they content themselves with the easier, but less effective method of dressing the shoots which naturally spring up from the old stumps left in the ground on cutting the former crop.

"Being limited with respect to time, we found it impossible to prosecute our journey farther than Port-Souillac. We therefore agreed to return, and left Mounerou's after breakfast. On our way back to Jacoté, I observed several clumps of *Hernandia sonora*, and *Scævola Kœnigii* skirting the shore. We arrived at M. Etienne Boulger's, the Civil Commissary, to dinner. It was this gentleman who was carried off by the boats of the Nereid. He was afterwards exchanged for twelve or fifteen seamen, and speaks in the highest terms of the handsome treatment he experienced during his detention. M. Boulger is one of the richest planters in the island, his establishment of slaves amounting to upwards of six hundred. His house is built on a high platform which slopes rapidly towards the shore on one side, and on the other to a small river which runs through the plantation, and discharges itself into the Bay of Jacoté, at the distance of a few hundred yards from the house. The stunning noise of the surge rolling over the reef is softened by a thick grove of native wood, which at the same time conceals from view the agitation of the ocean. Another object, still more offensive, is concealed from the eyes of the stranger by the removal of the slave cantonment to the centre of the plantation. This judicious arrangement,

rarely adopted by the planters, gives to M. Boulger's residence the air of a gentleman's country-seat in Europe. After dinner, we were furnished by our host with horses to carry us to Blancard's, where we remained that night.

" Our road next morning led us round the Baie du Cap, after which we had to scramble over a difficult pass called the Chemin des Bœufs. This defile, hardly practicable even to foot passengers, is the common channel of communication between the Savanne and the leeward side of the island. On turning the Pointe de Corail, at which the latter commences, we had the Morne de Brabant. This singular mountain, connected with the island by a low isthmus, has the most picturesque appearance imaginable. It is a perpendicular rock, three hundred fathoms in height; the summit an inclined plane, the only access to which is by a narrow intricate path, terminating at a frightful chasm in the rock, over which the trunk of an old tree serves as a bridge to such as venture to cross it. The summit of the mountain is said to be occupied by a few runaway slaves, who eke out a miserable and precarious existence by nocturnal depredations on the neighbouring farms.

" From the Morne the road leads through a succession of plantations along the shore, not far from which is the 'Ile Morne,' a low coral bank, covered with a fine grove of cocoa palms. Between the road and the shore there is a thick belt of *Hibiscus tiliaceus*, a large distorted shrub, at this time in full blossom. The bark of this shrub is so tough as to serve the common purposes of cordage, and the wood so light, that the fishermen use it as a substitute for cork. We passed through several fields of wheat, the produce of which had just been gathered in; and we observed groupes of slaves in the act of thrashing it. The sheaves were arranged on an elevated platform, and ten or fifteen slaves of either sex, standing in a circle, with long, heavy switches, kept beating them until the grain was disengaged. This operation was carried on in a sort of measured cadence, regulated by a plaintive musical chorus, which, at the distance we passed, struck our ear as very

melancholy, and reminded us of the beautiful lines in 'Marmion,'—

'Such have I heard in Scottish land
Rise from the busy harvest band,
When falls before the mountaineer,
In lowland plains, the ripened ear.
Now one shrill voice the notes prolong;
Now a wild chorus swells the song:
Oft have I listened and stood still,
As it came softened up the hill,
And deemed it the lament of men
Who languished for their native glen.'"

From the Isle of France, Capt. Carmichael paid a visit to the Isle of Bourbon; and his account of that country is peculiarly interesting, especially to the Naturalist.

"In the year 1813, I obtained leave of absence for a few months to visit the Island of Bourbon. With this view I embarked, the 31st July, on board the Semiramis frigate, and landed at Saint Denis, the 2d August. As we remained the whole morning becalmed within a few leagues of the shore, we had an opportunity of viewing, to great advantage, the general outline of this interesting spot. The rays of the rising sun, sweeping from ridge to ridge, threw every depression on its surface into shade; and the whole island, as far as the eye could penetrate, seemed cloven to the very base by a series of gloomy chasms that cut it into numerous detached masses radiating from a common centre. Over the middle region of the island, the clouds of night still floated in fleecy volumes; while the Piton des Neiges, piercing through the veil, stood exposed to view, like one of those volcanic rocks that meet the eye of the mariner in the midst of the ocean.

The anchorage of St. Denis is an open roadstead, exposed to the wind, which blows, with few intermissions, from the eastward, sweeping along the coast. The beach is uncommonly abrupt, and the landing, by reason of the surge, hazardous. The ruin of a pier, erected by La Bourdonnaye, still serves to support a platform that extends beyond the breakers, and where all commodities are embarked or

landed. The Government-House stands within two hundred yards of the landing-place; and the village is situated to the right, on a plain of alluvial sand, resting on a bed of lava. In the nucleus, or older part of the village, the houses are pretty much crowded, and the streets paved, to the grievous annoyance of the walking public, with water-worn pebbles from the beach. The more modern part is divided into square compartments, by streets intersecting each other at right angles. Each of these compartments is occupied by a dwelling-house, surrounded by its pavilions, offices, and kitchen; and the outline planted with a row of mango, tamarind, and acacia trees.

"The River of St. Denis flows into the sea close by the left of the village. It has cleared for itself a bed at least four hundred yards in diameter, through a mass of lava, the mural section of which stands now on each side of it at the height of two hundred feet. The ordinary current of the river, however, does not occupy one-twentieth part of this space, and a great portion of it has been converted into garden plots. During summer, the stream has no apparent outlet, but oozes imperceptibly through a bar of pebbles thrown up by the surge. But the fragments of a stone bridge strewed along its channel, sufficiently attest the strength and rapidity of its winter course.

"My principal object in visiting Bourbon, was to acquire some knowledge of its vegetable productions. After having explored the mountains and ravines in the vicinity of St. Denis, I projected a tour round the island, in which Dr. Strachan, the chief medical officer on the station, agreed to accompany me. Having made our arrangements for the journey, we left St. Denis on the 12th November. The road between St Denis and Possession is the most difficult in the whole island. For the space of ten miles, it is nothing but a continued succession of ascents and descents in zigzag, cut in the precipitous sides of the mountain over which it leads. To avoid the personal fatigue of this part of the journey, we despatched our horses overland in charge of a couple of blacks, and took our passage by water in a

large pirogue, which carried us to Possession in a couple of hours.

"Many of the mountains and rivers, as well as all the geographical divisions of this island, are named after some saint or other, male or female. Bourbon offers, in this respect, a curious contrast with the sister island, where we find no more notice taken of those holy personages, than if their names had never found a place in the kalendar. Had the imposition of names in Mauritius taken place during its occupation by the Hollanders, such a circumstance need excite no surprise. But this was by no means the case, all the names, with very few exceptions, are French; and yet, among the whole, I can only recollect one solitary saint, the apostle Peter, charged with the superintendence of a district. During the greater part of the last century, the French philosophers are alleged to have been actively employed, by means of their writings, in undermining the foundation of the national faith. The colonization of Mauritius commenced about that period, and long subsequent to that of Bourbon: may we not attribute the circumstance above-mentioned, in part at least, to a change effected in the meantime by the new philosophy, in the religious ideas of the people? Whatever may have been the cause, the fact itself, though unimportant, is rather curious.

"The mountain between St. Denis and Possession, which has been named after St. Francis, terminates in a huge promontory, several hundred fathoms in height, presenting a mural front to the sea, and fenced against the waves by the immense fragments, which, detached successively from its face, have rolled into the deep. Let us suppose a mountain formed by a series of volcanic eruptions, consisting, at one time, of lava in a state of perfect fusion, and disposed to consolidate either into one amorphous mass, or into distinct masses of a determinate figure; at another time, of solid or semi-fluid masses, borne along by the intervention of a more fusible vehicle. Let us suppose these eruptions repeated for ages; each successive stream filling

up the vacuities and fissures, and winding round the inequalities in the surface of that which immediately preceded it. If such a mountain were severed across, and one moiety entirely removed, the remaining section would exhibit precisely the appearance that is presented by Cape St. Francis.

" The distance from Possession to St. Paul is eight miles; the road passing over a plain of considerable breadth, which terminates in a tongue of land called Pointe des Galets. The plain is stony and barren, yielding only scattered tufts of a hard grass of the genus *Aristida.* It bears evident marks of recent formation, and consists, for the most part, of the wreck of the high land rolled down during the rainy season by the Rivière des Galets. This stream has repeatedly changed its course, and is now gaining ground in the direction of St. Paul. Should it work its way into the marsh behind that village, it may facilitate, or, more probably, frustrate the execution of a plan long since projected, of converting that basin into a harbour.

" The village of St. Paul is built in a straggling manner, on a narrow neck of land, stretching between the shore and the marsh. A straight causeway runs from one end of the village to the other, agreeably shaded with *Acacia trees* (*Mimosa speciosa,*) now in full flower, and diffusing a delightful fragrance.

" From St. Paul to St. Leu, the road runs along the steep side of a mountain, which, as far as the clouds permitted us to see, appeared in a high state of cultivation. It is intersected by deep ravines, dry for the greater part of the year; but occasionally collecting the mountain-showers into furious and impassable torrents. The sides of these ravines are clothed with a great variety of trees and shrubs, interwoven with elegant festoons of climbing plants, among which are the *Passiflora, Smilax,* and scarlet *Ipomea,* with a vast profusion of *Convolvuli;* the magnificent flowers, and fantastic twinings of which, attract the eye of the Botanical traveller, to the imminent danger of his neck.

" After a few hours' ride we arrived at St. Leu. This

little village, consisting of from eighty to an hundred houses, is built without any rigid regard to regularity; but is interspersed with *Cocoa* and *Date-palms*, that give it a pretty rural air. It is situated on a low coral bank thrown up by the sea against the base of the mountain. It has a small inn, the only house of entertainment in the whole island, at which we took up our quarters for the night. In the course of the evening, we witnessed a method of fishing, common enough in Mauritius, but in Bourbon confined to this particular spot. A party of about a dozen blacks, having a net fifty yards in length, walked out on the reef, where the water was from three to four feet deep. Having stretched the net across the reef, with a man at each end of it, the rest of the party formed a circle two or three hundred yards wide, and began flogging the water with long switches, shouting and screeching, and making every sort of noise, to frighten the fish. In this manner they gradually contracted their circle, and, closing in towards the net, drew the ends of it together. Their labour this evening, however, was entirely fruitless. The only fish usually taken by this process is that which they call the *Licorne*, (*Acanthurus Unicornis*,) a dry, insipid fish, used only by the slaves.

"The only part of Bourbon edged with a coral-reef, is that portion of coast which extends from St. Leu to St. Pierre; around the rest of the island the shore sinks abruptly to a depth at which it is probable that the coral-worms cannot live. This depth, however, is in a progressive state of diminution, from the spoils of the mountains annually swept down by the torrents, and deposited along the shore. From St. Benoit to St. Paul, round the north end of the island, there is an uninterrupted bank of water-worn pebbles, partly thrown back by the waves, partly rolled into the deep water, and forming a series of roadsteads along that part of the coast.

"The district of St. Leu enjoys the reputation of producing the best coffee in the island, and perhaps in the world, excepting that of Mocha alone. For the greater part of the year it labours under a scarcity of water, more

particularly the village, where they have endeavoured to procure a supply by sinking wells in the coral-bank; but the produce, though fit for use, is rather brackish.

"We left St. Leu early in the morning of the 14th, and pursued our journey over a road encumbered with stones, but nearly destitute of those ravines which had rendered our progress during the preceding stage so slow and difficult. The land is cleared and cultivated to a great height along the acclivity of the mountain; and the only memorials remaining of its former state, are a few *Lataniers* and *Benzoin* trees, battered by the winds, and verging gradually to decay. About twelve miles from St. Leu, we passed a remarkable sand-bank, which extends upwards of a mile in length, and seems to be creeping slowly up the side of the mountain. The sand is of a bluish-grey colour, and affects the form of ridges or wreaths, in the manner of drifted snow. It might almost be supposed that some extraordinary cause had accumulated all the sand in the island on this particular spot, as there is hardly a particle to be seen in any other place.

"The church of St. Louis, for there is no village in the district of that name, stands about four miles from the sand-bank. We purposed halting here for a night, and called on a planter to whom we had letters of introduction; but he happened to be from home, and we agreed to prolong our ride to St. Pierre. Close by St. Louis we crossed the River St. Etienne, at this time an inconsiderable stream, but with a channel several hundred yards wide, and obstructed by huge masses of stone jammed against each other. Within two miles of St. Pierre, we passed over a high rampart of lava, the uncommon aspect of which excited our attention. It is a confused mass of gravel, pebbles, and angular fragments of trap, firmly agglutinated by a cement of the appearance of mud, and differing very little, on a superficial view, from conglomerate. As this rampart is composed of several distinct beds lying over each other, with a surface nearly destitute of vegetation, it may be reasonably inferred that it is the result of successive and comparatively recent eruptions.

"The village of St. Pierre ranks in size and importance next to that of St. Paul. It is built on a gentle slope, within half a mile of a commodious landing-place, formed by the mouth of the Rivière d' Abord, and is furnished with barracks for three hundred men. I was less pleased with this village than with any that I had yet seen. The ground in its immediate vicinity is intolerably stony; and the trees scattered through it are stunted in their growth, decayed at the top, and all inclined to one side, as if they had yielded to the impulse of a constant wind from the other.

"The acclivity of the mountain, reaching to the Plaine des Caffres, is in full cultivation, and yields to no part of the island in its crops of grain and coffee. This district is famed also for the peculiar excellence of its honey. The hives are made of the trunks of trees, artificially hollowed, and left in the woods, or placed near the slave-huts on the forest, with a swarm lodged in each. The bees range the forest at large, and collect their store from various sorts of flowers, according to the season. But the green honey of St. Pierre is alleged to be the exclusive produce of a tree called by the Colonists '*Tan rouge*,' (*Weinmannia mellifera, C.*) Were this, however, the case, all the honey in the island ought to possess similar qualities; as the *Tan rouge* is equally common in all parts of the forest. Be this as it may, the green honey is distinguished by a peculiarly strong and agreeable odour, and by its imparting a green colour to water in which it is diffused.

"About twelve miles from St. Pierre, which we left early in the morning of the 16th, we came to a deep ravine, that forms the boundary of the district of St. Joseph. Here little of the ground has been cleared; and the proximity of the forest has a manifest influence on the appearance of vegetation. A rank and luxuriant herbage, the result of frequent showers, and at this time loaded with the morning dew, gave a peculiar freshness to the landscape. The scene that opened on our view when we looked down upon the district of St. Joseph, is unquestionably the most picturesque in the whole island; and we paused almost involuntarily to gaze on

it. The morning was serene, and the sky without a cloud. The sun had just cleared the horizon, and tinged with his golden beams the summits of numerous small conical hills that stood scattered over the plain, amidst cultivated fields, clumps of wood, and tracts of vitrified lava. On the right hand lay the coast, fortified by a rocky rampart of fuliginous aspect, recently expelled from the bowels of the earth by the force of one element, but now opposing, with sullen defiance, the assaults of another. On the left, we had a distant view of the burning dome of the volcano, towering above the neighbouring peaks, and shaded by its smoky parasol.

"Having crossed the ravine, we soon arrived at the residence of M. Loiseau, where we breakfasted, and rested for a couple of hours. We thence continued our journey by a path that led through the scene which had enchanted us in the morning. But the enchantment was now gone. The imposing grandeur which distance lent to these irregularities of nature vanished when we came to view them in detail, and gave place to a very different sentiment when they met us as obstacles not easily to be got over. After a tedious day's journey, we arrived in the evening at the house of a M. Deley, where we were received with great hospitality.

"The settlement of this district is of recent date. Its distance from the seat of Government; the general sterility of its soil; an inaccessible coast on one side, and on the other a burning mountain, always active and threatening every thing with instantaneous ruin; these were obstacles sufficient to deter adventurers of ordinary resolution from settling in St. Joseph's, and nothing, one would suppose, but misfortune or crime, could urge human beings to secrete themselves in such a desolate region. Thinly scattered over a rugged soil, that yields but a precarious return to the cultivator, the inhabitants of this district have lost, in a great measure, the loquacious and gregarious disposition that forms so prominent a feature in the French character; and have acquired, in lieu of it, the recluse, taciturn, independent habits of the boors of South Africa.

"About six miles beyond Deley's residence, the tract of

country called the 'Pays brûlé' commences. From the 'Rempart de Tremblet' we had a full view of it, stretching across to the 'Rempart de Bois Blanc,' and up to the dome of the volcano. The complexion of this dreary expanse is as varied as the periods at which the eruptions took place which covered it with lava. In many parts, the lava still retains the vitreous appearance it had acquired by fusion. In others, the surface is sprinkled over with a small shrubby *Lichen*, which gives it a hoary appearance; and in the fissures and crevices a variety of *Ferns* spring up, intermixed with shrubby plants, among which I remarked the *Rubus rosæfolius*, *Andromeda salicifolia*, *Scævola Kœnigii*, *Pemphis acidula*, and *Pandanus Vacqua*, the two last close to the shore, and literally washed by the spray. A few spots that had escaped the later eruptions are clothed with trees, and appear like Oases in the desert.

"The lava that has undergone complete fusion is as black as jet, extremely porous, and holds numerous crystals of *olivine* enveloped in its substance. The layer is, in many parts, not more than a few inches in thickness; and its surface is distorted into a variety of fantastic shapes, mimicking coils of rope, the convolutions of intestines, or the sinuosities of the brain. It appears as if the lava, while in a semifluid state, had been puffed up by the rarified moisture of the ground over which it had spread; and that the more liquid, or central part, had receded to the circumference, and raised the still yielding crust into these irregular contortions. A person runs some risk in walking over this sort of lava, on account of its fragility, and the numerous cavities underneath it, into which he is liable to sink as he would through ice.

"From the appearance of this sheet-lava, as it may be termed, it is hardly possible that it could have been discharged from the summit of the mountain, or from any considerable height on its side. It could not preserve its fluidity in passing over such an extent of surface; besides that we find it spread like a carpet over large tracts of absolutely level ground, where its progress must have been

extremely slow. It is much more probable that it emerged through fissures or small craters scattered along the base of the mountain. In one cliff whence a mass of lava had been recently detached, I numbered, in a diameter of six feet, eight distinct layers, perfectly consolidated, but readily recognised as the result of successive appositions, by the compactness of the lower side of each layer, and the porosity of the upper.

"In the eruption which took place last year, the lava descended close by the Rempart de Bois Blanc, and reached as far as the sea-shore. This lava is of a quite different character from that which incrusts the greater part of the Pays brûlé. It appears as a huge rampart or ridge, five hundred yards at least in diameter, and thirty or forty in height, consisting of a vast accumulation of stony fragments, firmly consolidated, but still retaining their respective forms; thus proving that they had not undergone complete fusion, but been merely so far liquified on the surface as to enable them to slide over each other in their descent; nor is it unlikely that the greater part of them had previously covered the declivity of the mountain, and thence floated down in the stream, which now acts as the bond of union between them.

"On casting my eyes over the Pays brûlé, I was irresistibly struck with the idea that it must have sunk at some remote period from the level of the ramparts by which it is flanked. These ramparts are on the general level of the country behind, and terminate in a bold elevated coast. This line suddenly breaks off, and we have a tract of country, six miles over, sunk more than one hundred fathoms below the level of the ramparts, with a coast of only a few fathoms above the level of the sea, and that apparently formed by recent accretions of lava. The volcano is surrounded behind by a semicircular rampart called 'l'enclos,' which connects the other ramparts; thus enclosing the mountain and the Pays brûlé within them. The inference from these appearances is hardly avoidable, that the latter have sunk at least one hundred fathoms from their former level. In confirma-

tion of this opinion, it may be observed that the coast which borders the Pays brûlé recedes considerably, forming a portion of a circle, of which a line drawn between the points of the two ramparts would be the chord.

"A late French traveller has described, in glowing language, the melancholy impression made on his mind by the frightful sterility of the Pays brûlé, and by its 'profound solitude, undisturbed by the screams of birds or the voice of man.' To a person who has travelled much in Bourbon, unless he belongs to the sentimental caste, the Pays brûlé is not the part of the country most likely to suggest those frightful ideas of sterility which a florid detail of its horrors is apt to excite. For its extent, it is the smoothest portion of the whole island, and, at certain seasons of the year, less repulsive than many others. Nothing can be more dismal, in truth, or more strongly indicative of barrenness, than those tracts all over the island, which, stripped of their native wood, are left in an uncultivated state. At this season, in particular, when the herbage is parched by the sun, or set on fire, according to annual practice, they present to view a surface as black as the Pays brûlé; and are, besides, disfigured by ridges and chasms, and by fragments of rocks and stones, strewed over the ground, or piled on each other in the strangest confusion. The Pays brûlé is void of all these asperities; its surface is unbroken, and it possesses also its vegetation, such as it is. Its *Lichens* are a little shrivelled at present, it must be confessed, but let the slightest shower fall, and they assume a delicate verdure, what Botanists term a 'glaucous green,' the softest and most pleasing of all colours, reminding us of the first frail efforts of spring after the ravages of a boisterous winter. Nor is it in Bourbon that a man of genuine sensibility would be most likely to feel the ennui of solitude, or to wish it disturbed by the voice of man, where that voice most usually assails the ear in the half-stifled groan of the slave bending under his burden.

" From the Pays brûlé to the village of Ste. Rose, the road passes through a succession of plantations in the midst of a natural scenery of great beauty. This district enjoying the

benefit of more frequent showers than most other parts of the island, its soil is, in consequence, more productive, and the progress in clearing the land more rapid. We remained for a night at the habitation of M. La Renaudie, an old gentleman who has the character of being the most loyal man in the whole island. Symptoms of attachment to the British, prematurely betrayed on our first attack on Bourbon, would probably have cost him his life; but for the timely arrival and success of the second expedition, by which he was fortunately rescued from the clutches of Governor de Caen, who had ordered him up to Mauritius to stand his trial for high treason.

" The chief produce of La Renaudie's estate is the *Clove;* and on our arrival, we found the whole family busily employed in gathering the crop. Though the produce was considered this year as under an average, he calculated on a return of 300 cwt., and stated the ordinary market-price at half a dollar the pound. They carefully collect the flower-stalks of the clove, and extract from them, by distillation, an oil which possesses the valuable qualities of the spice. It was here I first saw the *Ravensara*, or *Madagascar Nutmeg-tree*, (*Agathophyllum aromaticum.*) It is a handsome tree, and grows in great perfection, but is cultivated merely as an object of curiosity, no use being made either of its leaves or fruit, though both of them are highly aromatic. The only part of the fruit possessed of the aroma is the fleshy coat investing the shell. To the taste, I could perceive scarcely any difference between it and the clove; but as I have no pretensions to the acuteness in that sense which distinguished the renowned family of the Panzas, I must yield the point to those who insist on discerning in the *Ravensara* a combination of all the aromatics.

" Though the rains are frequent in this district, there is a great scarcity of springs, the ground being so open that the water filters instantaneously through, and appears no more until it arrives nearly at the level of the sea. From a spring in this situation, the establishment of M. La Renaudie derives its whole supply for a great part of the year. Even in the midst of the Pays brûlé we found fresh water in a hole

excavated in the sand, within three or four miles of the sea. Such springs may be looked for with a certainty of finding them round the whole coast. The known laws of hydrostatics would indeed teach us to expect water in all such situations, not only in this island but in every part of the globe.

"We left La Renaudie's about sunrise, and shortly thereafter crossed the River de l'Este, which bounds the district of Ste. Rose on the north. This is the largest and most impetuous torrent in the whole island. Every other river has its periods of quiescence; this is perpetually in an uproar. Even at the time when we crossed it, though the stream was hardly five yards over, the passage was not effected without some risk, its depth and rapidity rendering it always unsafe. Its winter channel is a quarter of a mile in breadth, and paved with enormous masses of stone rolled down from the mountain, and wedged against each other.

"After crossing the river, the road leads along a belt of alluvial land close by the shore. The acclivity of the mountain on the left hand is cleared to a great height, and covered with flourishing plantations. This district enjoys, in common with Ste. Rose, the benefit of copious showers from the eastward, which enhance its fertility. After an easy ride, we arrived in the evening at the habitation of M. Hubert, where we took up our lodgings for the night. Next morning we breakfasted at the house of M. de Jean, in the district of Ste. Susanne, and afterwards walked through his garden, where I for the first time saw the *Garcinia Mangostana* and *G. Gambogia*. The *Litchi* trees (*Dimocarpus Litchi*) in this garden were so loaded as to render it necessary to have their branches propped, to prevent their breaking down under the weight of the fruit. The nature of this fruit does not seem to be well understood by Botanists. In all our systematical works it is termed a berry; but it is in reality a two-valved capsule, (the second germen proving always abortive,) containing a single large seed, or rather nut, invested with a fleshy arillus. This last, which is the only eatable part of the fruit, is entirely unconnected either with the nut or the capsule, except at the very base. It is open and jagged at the top,

and the segments doubled over each other so as to conceal the nut from view.

"From M. de Jean's we came to the Lieutenant-Governor's place, and, after an early dinner, rode home to St. Denis in the evening of the eighth day from the period of our departure.

"The Island of Bourbon is of an oval figure, and near fifty miles in its greatest diameter. It consists of two volcanic mountains rising gradually from the sea, and connected by an intermediate plain. That which stands at the northern extremity terminates in the Piton des Neiges, the highest land in the island, and estimated at 10,000 feet above the level of the sea. Though this mountain has long ceased its eruptions, the character of its igneous origin is too unequivocally stamped to escape the notice of the most superficial observer. The volcano, properly so called, rises at the southern extremity, and still retains its full energy, a year scarcely passing without an eruption; and it has been remarked, within the last thirty years, that in ten of these eruptions the lava flowed as far as the sea. These mountains are connected by a barren tract called the 'Plaine des Caffres,' varying in height from 4,000 to 5,000 feet.

"The feature which most strongly distinguishes this island from all others, is the prodigious depth of the chasms by which it is intersected. These are bounded by mural ramparts of solid rock, several hundred fathoms in height, and approaching so close, that not more than three or four degrees of the celestial arch are visible from the bottom of the chasm. The ramparts are composed of successive beds of compact lava, interstratified with others of stony fragments, consolidated by an earthy or cineritious cement. The latter being more prone to decomposition, crumble away, leaving the lava impending in the air in huge projecting shelves. Undermined to a certain depth, these also give way, and, shattered to a thousand fragments in their fall, are swept away by the torrent and rolled into the sea. Sometimes the whole side of a hill, with all its trees, slides down at once with a thundering noise into the abyss, and

chokes it up for a season; and the mountains are everywhere disfigured with scars, caused by the removal of large portions of their surface, annually undermined, and precipitated into the ravines.

" The principal rivers of Bourbon are the R. de St. Denis, des Galets, de St. Etienne, d'Abord, de l' Este, du Rempart, and du Mat. All these streams are impassable torrents during the rainy season, pouring down an immense volume of turbid water; but, for the greater part of the year their current is feeble, and in many of them it ceases entirely for a time. The island is divided into ten districts or parishes, St. Denis, St. Paul, St. Leu, St. Pierre, St. Joseph, Ste. Rose, St. Benoit, St. Andre, Ste. Susanne, and Ste. Marie. Each district is under the superintendence of a magistrate, having the title of civil commissary, whose functions are somewhat analogous to those of a justice of the peace. To this office a salary of seventy dollars per month is attached, besides a variety of perquisites that render it a desirable object to the most respectable planters.

" The soil of Bourbon, like that of Mauritius, is nothing more than the reddish argillaceous earth, produced by the decomposition of the lava, with little admixture of genuine vegetable mould. It is, nevertheless, abundantly productive, though it derives no benefit from artificial irrigation, on account of the depth at which the streams run beneath the general level of the ground. The chief articles of produce are coffee, cloves, sugar, cotton, wheat, rice, maize, and manioc. Great quantities of wheat and rice are exported to Mauritius. The maize and manioc are cultivated for feeding the slaves and horses; the other articles are designed for the Europæan market.

" There are, however, physical obstacles to the cultivation of this island, which will arrest it long before it shall arrive at the extent and perfection which it would be likely to attain under more favourable circumstances. The base, or low ground, is already fully occupied with plantations, and the only direction in which they can henceforth be extended is up the acclivity of the mountain. But this is too steep to

permit the use of wheel-carriages, or even beasts of burden. The produce must therefore be carried to the market by slaves, at a prodigious expense of labour. For this purpose, it is put up in bags weighing about one cwt., and you will often see on the road to St. Denis, strings of fifty or sixty slaves, each with his bag, trotting along, and chanting a melancholy air, half song, half groan, to which each individual adapts his pace, according to his strength and the delicacy of his ear. This is by far the severest labour that falls to the lot of these unfortunate beings.

" The Islands of Mauritius and Bourbon are justly famed for the wholesomeness of their climate. The heat, though considerable, is tempered by refreshing breezes; and its variations are so slight and regular, that we never experience those sudden transitions from one extreme to another, which, in other parts of the world, prove so trying to the constitution. The only diseases from which the Europæans are liable to suffer, are such as spring from their own intemperance. Dysentery and inflammation of the liver, have, from this source, been peculiarly fatal to the British soldiers.

" The uncommon salubrity of the air has been rather fancifully ascribed to the agency of the hurricane, which is supposed to sweep off, in its periodical visits, all noxious miasmata. But it does not appear that these islands are peculiarly subject to the visitations of this violent prophylactick; at least, during the first four years they were in our possession, none of those supernatural and appalling signs were remarked which are said to announce its approach. No season passed over, it is true, without one or two furious squalls of wind and rain, which made the regular tour of the compass; but they came on, and departed again, without any warning whatsoever.

" The following Meteorological Table was extracted from a register kept in one of the military hospitals, for the first nine months at Port-Louis, the remainder at Mahébourg.

1813.	Heat.						State of the Weather.		
	7, A. M.		1, P. M.		8, P. M.		Fair.	Rainy.	Cloudy.
	Max.	Min.	Max.	Min.	Max.	Min.			
January, ...	84	83	88	85	86	83	14	6	11
February, ...	85	81	88	83	86	82	12	8	8
March, ...	83	80	85	82	83	81	22	1	8
April, ...	82	80	84	82	83	81	22	—	8
May, ...	77	75	82	77	78	75	19	—	12
June, ...	75	70	78	72	76	71	17	4	9
July, ...	72	70	76	72	74	71	18	1	12
August, ...	73	69	77	73	74	69	22	2	7
September, ...	74	71	80	74	76	72	16	—	14
October, ...	76	71	80	73	76	72	21	3	7
November, ...	80	75	84	80	80	77	21	—	9
December, ...	81	77	85	80	82	78	20	1	10

"These islands afford, as might be expected, no great scope to the researches of the Zoologist. Of the *Mammalia* I can only recollect one species of *Simia*, two of *Vespertilio*, the *Manati*, *Musk-shrew*, *Tandrec*, the common *Rat* and *Mouse*, the *Hare*, the *Ceylon Deer*, the wild *Goat* and wild *Hog*. Of these animals, scanty as the catalogue is, the most important have been introduced since the discovery of the islands; and along with them, it is said, that the Portuguese navigators introduced horses and black cattle, both of which were found, on the arrival of the French settlers, to have prodigiously multiplied. That goats, hogs, and deer, should have prospered in a wooded country, is by no means improbable: that a certain proportion even of black cattle might have subsisted on the scanty, sickly herbage produced in such a situation, there can be no reason to doubt; but when we view the external features of these islands, more especially of Bourbon—its surface strewed with lava, intersected by ravines, and covered to the water's edge with an impenetrable forest—it requires all our faith to believe that the horse should have multiplied on such a spot, for no situation could be imagined less favourable for the propagation of a lively, high-spirited animal, destined, from its speed and activity, to range in freedom over the open regions of the globe.

" The monkey of these islands, a variety, I believe, of *Simia Aygula*, measures from three to four feet in length, of which the tail constitutes rather more than one-half. The body is of an olive colour, the belly bluish-grey. They secrete themselves in the forest, from which they make frequent and destructive inroads on the cane plantations.

" The *Ternate Bat* (*Vespertilio Vampyris*), like the rest of its tribe, is never seen on the wing during the day. It is probably to its uncouth form and nocturnal flights, that this animal owes the noxious character so generally ascribed to it; for, in the eyes of the vulgar, an hideous aspect, and a disposition to shun the light, are invariably typical of evil. They have, accordingly, borrowed the claws of the Vampyre and its coriaceous wings to decorate the father of all evil; and have endowed it, in return, with a portion of the malign propensities of that personage, which it exerts, when occasion offers in piercing the veins, and sucking the blood of such as unwarily lie down to repose under the canopy of heaven. This article of faith, however, is not universally subscribed to, the better informed Colonists regarding the latter part of it at least, as apocryphal. Any person, indeed, who will give himself the trouble to examine the organization of its mouth, will readily perceive, that, notwithstanding the authority of Linnæus, the Vampyre is furnished with no peculiar apparatus for phlebotomy, and that, if it should feel a thirst for blood, it must procure it by the ordinary process of tearing open a vein with its teeth, an operation, the pain of which the soporific exertions of its wings could hardly assuage, so as to protract the slumber of its victim. The Vampyre grows to a large size. I had a specimen in my possession that measured four feet across the wings. It is known by the name of '*Chauve-Souris des Bananes*,' and is believed to subsist on the fruit of the plantain, the ebony, and various others. It is brought occasionally to market as an article of food, and is said to be extremely delicate.

" The *Manau* or *Lamentin*, (*Trichecus borealis*,) is sometimes seen prowling along the reefs. There was one caught, not long ago, at the mouth of the Black River, which

measured sixteen feet in length. It was brought to Port-Louis, and after being left exposed for some time to the inspection of the curious, was cut up and sold in the market. It is said to be no bad substitute for beef.

"The *Musk-shrew* (*Sorex cæruleus*) probably found its way to these islands by the ships trading with India. This is the animal so much dreaded by our wine-bibbers in the East, who assert that if one of them happens to run over a bin of wine, the whole becomes instantly tainted, its odour being of so penetrating a nature as to make its way through the pores of the glass. This story, which appears to be swallowed with less reluctance than the musked wine, remains, however, still to be verified; the accounts being so various and so contradictory that nothing conclusive is known respecting the manner in which the contamination is effected. After many inquiries on this subject, I never met with any person who would positively maintain that he had known an instance of wine bottled in Europe being tainted by the musk-rat. Should this prove true, it would be conclusive of the question, and remove the blame from the rats to the cork-venders, who toss their bags into corners, where they lie exposed to the nocturnal visits of these stinking vermin.

"The *Tandrec* (*Erinaceus Madagascarensis*) is considerably larger than the common *Hedgehog*, to which it bears a close resemblance in its figure. Its fur is of a light-brown colour, and is mixed with rigid bristles, of which those on the shoulders and back of the neck only are spinous. These animals feed on insects and fruit, and are seen everywhere in the wood, either solitary or in small flocks. Their sphere of vision seems to be particularly limited.

"The *Hare* abounds in both islands, and furnishes the most usual article of game for the table. The islanders supply themselves, with little trouble, by sending a few dogs into the cover to chase out the hares, while the sportsman watches near their usual track, and shoots them as they run past. In the eyes of our English sportsmen, this manner of treating poor puss seemed little short of sacrilege; so, with a view to introduce a more generous system of warfare, they

formed themselves into a hunting-club, organized all the curs they could lay their hands on into a pack of hounds, and sallied forth in scarlet frocks with green collars. But it would not do. They speedily discovered that, in calculating the chances of catching the hare or of breaking their own necks, the odds were hollow in favour of the latter.

"The *Deer* of Mauritius is, I am disposed to believe, a variety of the *Cervus Axis*. It is rather larger than the fallow-deer. Its hair is of a chestnut colour, long and shaggy on the old animals, and the male has a long beard. The horns are from two to three feet long, and measure nearly as much from point to point: they send off two successive branches in front, and are studded all over with tubercles. The deer frequent chiefly the districts of the Black River, and the Savanne. When hard pushed by the hounds, they make for the sea side, and dash into the water with as much boldness as if it was their natural element.

"The catalogue of the indigenous birds is nearly as brief as that of the quadrupeds; and of them also, the most interesting have been introduced from other countries. The most remarkable of the latter is the *Guinea-fowl* (*Numidia Meleagris*), of which large coveys are sometimes seen on the outskirts of the forest. Two species of the *Partridge* are pretty abundant, one resembling the common partridge of England; the other is the *Tetrao Madagascarensis*, called from its spotted plumage, the 'Pintade.'

"The *Mayana* (*Gracula tristis*) was brought at an early period from the Molucca Islands, for the purpose of repressing the ravages of the locust, which threatened the ruin of the infant Colony. The circumstances attending the introduction of these birds, are detailed in Buffon's Natural History, in which are also related, with due solemnity, the charge preferred against them, of betraying their trust in aiding the enemy whose progress they were called in to check; their trial, their condemnation, and the summary execution that followed. Nor does the historian pass over the testimony of the Bourbon Faculty in their exculpation, which, though it came too late to save the lives of that

generation, insured the safety of the next, which it was found expedient to import. From that time the *Mayanas* have increased and multiplied without molestation, and at such a rate that it would create some trouble at this day to carry a similar sentence against them into execution, though they certainly are, with all deference to the Faculty, great devourers of grain and also of fruit, as well as of locusts. The notes of the *Mayana* are loud, clear, and extremely varied; and there are few birds that possess in higher perfection the faculty of mimicking those of other animals. Through the day they generally associate in pairs; but, towards sunset, assemble in myriads in some favourite grove, where they employ themselves until dark in chaunting their evening song. They are easily domesticated, and are great favourites with the Creoles, from their mimic talents.

"There is one remark which may be made with respect to all the small birds of these islands, so far as I was enabled to study their habits. Their method of constructing their nests is extremely simple and inartificial. None of those precautions are observable that indicate foresight and sagacity in guarding against the encroachments of predaceous animals. A few filaments of grass, interwoven in a careless manner in the fork of a low bush, serve to sustain the eggs during the easy process of incubation. It may at the same time be mentioned, that the islands are entirely free of all animals that prey on birds and their eggs.

"Of the *Amphibia*, I observed only one species of *Frog*, three of *Gecko*, and one of *Scink*. The *Frog* (*Rana esculenta*) was probably imported from motives of national partiality, though it is now, I believe, seldom or never used as food.

"The *Gecko heliotropica, C.* is the most beautiful, perhaps, of the whole lizard tribe. Its length is from six to eight inches. The body is depressed, of a vivid green-colour, with crimson dots: the belly is yellow; a streak of azûre passing over each eye, runs along the neck and shoulders, and there is a triangular spot of the same colour, edged with crimson, over the nose. The skin is shagreened with flat hexagonal tubercles; the tongue emarginate; eyes ex-

tremely brilliant; the legs short, toes dilated, four of them lamellated, the fifth hardly visible. In Bourbon, these reptiles are met with everywhere—in the houses, in the fields, and on the trees; but, in Mauritius, where they are by no means so numerous, you generally find them on the *Pandanus Vacqua*, creeping along, and licking off the luscious pulp that covers the core of the fruit after the nuts have dropped off. When these reptiles are irritated, their brilliant colours change suddenly to a dusky hue.

"The *Gecko cameraria, C.* is of a grey-colour, dotted with black. It is five inches long, of which the tail forms one half; body depressed, with a groove along the back; tail also depressed, and muricated on the sides. The toes are five in number, lamellated, and furnished with large hooked claws. A single row of subfemoral papillæ. May not these papillæ be peculiar to one of the sexes? During the day-time, these lizards remain concealed in holes and dark corners; but at night, they turn out in vast numbers, running along the walls and ceilings of rooms, and even on the glass of the windows, to which they adhere by means of their lamellated feet, preying on flies and small moths. Nor is it unamusing to watch their motions when the insects are on the opposite side of the glass, fluttering to get in to the light—the pause they make after each unsuccessful dart of the tongue, as if confounded at having missed so fair a shot. In the hurry of pursuit, they sometimes miss their hold, and drop down. I do not know a more unpleasant sensation than that which is excited by the fall of one of these little reptiles on the face, or any other naked part of the body. It invariably falls on its belly, which feels as cold as a piece of ice, and remains for some time stunned, and, as it were, glued to the skin.

"The *Scink* is about eight inches in length, of a pale-brown colour. It is uncommonly active in its motions, and very timid. In Bourbon it is abundant, but comparatively rare in Mauritius, and confined for the most part to the coral-banks.

"Navigators have described, in most glowing language,

the beauty of the submarine scenery that surrounds the islands of the Pacific Ocean. Those who have occasion to pass over the reefs of Mauritius will recognize the general accuracy of these descriptions, though they fall much short of the reality. The variety of colour and configuration exhibited by the coralline productions of these reefs, can only be exceeded by that of the animated beings that sport among their branches. Every variety of tint, from burnished gold or silver to the deepest black, is reflected in transient flashes on the eye, as they turn their polished sides to the solar rays.

"Nature has been, in this respect, less bountiful to the Isle of Bourbon. Its shelving shore, destitute of reefs, affords no shelter to the smaller and more brilliant tribes of fishes; and such as frequent its coast must be sought for in the deep sea, where the fishermen dare not venture with their frail canoes, except in very fine weather. Owing to this cause also, they are precluded from the use of the seine, as well as from another method of fishing, that furnishes a copious supply to the market of Port-Louis. The night-fishing on the reefs of Mauritius is managed much on the same principle as that which is still furtively practised on some of the small rivers of Scotland during the spawning season. A faggot of any inflammable wood is kindled in the pirogue, and illuminates the reef all round. The fish, attracted by the blaze, assemble round the boat, and are speared by the fishermen in vast numbers.

"The small extent of the Island of Mauritius, and its remote situation in the middle of the ocean, have necessarily limited the number of its vegetable productions; and various other causes, besides aiding to the same effect, have tended to stamp these productions with a peculiar character. The moderate height of its mountains is unfavourable to the propagation of alpine plants; and the thickness of its woods to that of such as require the full influence of the solar rays; while its rocky shores are covered with an animated crust that effectually prevents the establishment of those which vegetate only beneath the surface of the waves. We find,

accordingly, the *Flora Mauritiana* limited almost exclusively to trees; to climbing plants, which possess the faculty of elevating themselves, by the aid of trees, to seek the air and the light; and to a less aspiring tribe, which, satisfied with a smaller share of those vivifying elements, court the obscurity of the shade.

"On approaching the shore at the mouths of the rivers and bottoms of the bays, where the sea is always tranquil, the first object we encounter is a belt of *Mangrove trees* (*Rhizophora mucronata*, and *gymnorhiza*) edging the coast, and pushing even into the water. After we have crossed this belt, we come to another consisting of a great variety of trees and shrubs, that flourish within the reach of the sea-breeze. Among these we find the *Hibiscus tiliaceus* and *populneus* displaying their large bell-shaped yellow flowers, the *Hernandia sonora*, the *Erythrina carnea* and *Corallodendron*, with their superb spikes of scarlet blossoms, the *Barringtonia speciosa*, the *Ehretia argentea*, *Scævola Kœnigii*, and *Pemphis acidula*. Along with these we also find various species of *Convolvulus* and *Ipomœa* intertwined in elegant festoons, or trailing amongst the grass.

"Round a considerable portion of the island we can plunge at once from the shore into the forest, where we are struck, at first sight, with the great size of many of the trees, the height and straightness of their branchless trunks, and the comparative scantiness of their foliage. We are led, at the same time, to admire the various means by which nature, as if ashamed of the decay of her works, strives to conceal the approaches of old age by the aid of borrowed verdure. The numerous tribe of climbers are seen winding their flexile stems round the trunks of the aged trees, until they have arrived at the highest branches; then shooting down their filiform suckers to take root again in the soil, and thence absorb a fresh supply of juices. The creeping plants ascend more slowly; but garnish their supporters as they ascend with elegant wreaths of verdure. Lastly, the *parasitical plants*, properly so called, the *Orchideæ* and the *Dracænæ* fix themselves on the bark, and throw out spikes

of variegated flowers that sweeten the atmosphere with their odour. At length, however, the branches begin to drop off, and the whole tree runs rapidly to decay. At this stage it is deserted by all those plants that had lent their foliage to grace its latter days, and the veteran is left to fall alone.

"The surface of the ground is occupied chiefly by the *Ferns*. This extensive tribe seems to have been designed for the shade, as their vegetation is never more rapid, nor more luxuriant, than when they are buried in the most profound obscurity. This must be understood, however, with some limitation, there being several species that creep along the trunks of the trees; others which establish themselves at once as parasites, high up among the branches; and not a few that elevate their spreading parasols on their proper stem to the height of many fathoms.

"Those parts of the island that have been stripped of their native wood, and left in an uncultivated state, are annually overgrown with a thick crop of hard, reed-like grasses, consisting, for the most part, of *Anthistiria*, *Panicum*, and *Andropogon*. At the commencement of the rainy season, these grasses spring up with such rapidity, that in the course of a few weeks the ground is covered to the height of several feet, and exhibits an uninterrupted coat of verdure. This pleasing colour, however, soon passes away, and is succeeded by a fiery brown of a very opposite character. Vegetation now ceases entirely, and the sun and wind, asserting their power, lay the whole prostrate along the ground, where it lies bleached to whiteness, until, on the return of the periodical rains, a fresh crop springs up and covers it from view.

"The above remarks, modified by a few peculiarities, are equally applicable to the Island of Bourbon. The superior height of its mountains has rendered its alpine Flora rather more copious; but its coast, though destitute of coral-reefs, shelves so suddenly, and is so violently and incessantly assailed by a heavy rolling surge, that hardly any marine plants have established themselves on its shore."

[*To be continued.*]

ILLUSTRATIONS OF INDIAN BOTANY,

PRINCIPALLY OF THE SOUTHERN PARTS OF THE PENINSULA.

By Richard Wight, M. D., &c. &c.

[*Continued from Page* 110 *of the present Volume.*]

XI.

VALLISNERIA ALTERNIFOLIA.

Diœcia Diandria. Nat. Ord. Hydrocharideæ. *Juss.*

Gen. Char. *Flores* dioici.—Masc. *Spadix* conicus, undique tectus flosculis; *spatha* inclusus. *Perianthium* 3-partitum. *Stam.* 2.—Fœm. *Spatha* monophylla, uniflora. *Perianthium* 3–6-partitum. *Stigma* 3, bifida, extus quandoque appendiculata. *Bacca* unilocularis, cylindracea, polysperma. *Semina* parietalia. *Br.*

Vallisneria *alternifolia;* caulescens, foliis lanceolato-linearibus alternis denticulato-serratis, floribus sessilibus. (Suppl. Tab. XI.)

Vallisneria alternifolia. *Roxb. MSS. in Mus. of E. Ind. C. n.* 996. *Hamilton in Brewst. Journ. v.* 1. *p.* 34.

Roots fibrous. *Stems* branched, filiform, submersed, glabrous. *Leaves* alternate, most of them approximate, 3–4 inches long, grass-like, without any distinct nerve, but striated longitudinally, and beautifully reticulated, often twisted, acute, the margins serrated, the base amplexicaul. *Flowers* sessile, axillary, usually in pairs, diœcious. Male *spatha* resembling a capsule, broadly ovate, acute, compressed, diaphanous, opening into two concave, membranous, minutely striated and reticulated *valves.* *Spadix* about half the length of the spatha, covered with numerous small pedicellated *flowers,* which, at first sight, resemble *seeds.* At the time the anthers of these flowers are mature, the *pedicels,* which bear flowers, spontaneously separate from

the submersed spadix, and rise to the surface of the water, where they float, wafted by every breeze, till they have fertilized the *female flowers.* Each of these *male flowers* is 6-valved, the two external valves being larger and coloured, the four internal smaller, white or cream-coloured, all reflexed. *Stamens* 2. *Filaments* diverging. *Anthers* obtuse, bursting transversely across the summit; *Pollen* composed of diaphanous, globular granules.—FEMALE *spatha* sheathing, about as long as the germen, bifid. *Germen* inferior, ovate at the base, tapering gradually upwards into the long, filiform tube of the *perianth,* which, as well as its 3-partite *limb,* is reddish; *segments* obtuse. *Stigmas* protruded just above the limb of the perianth, 3-partite, the segments cuneate, irregular, often bifid, papillose, white. *Pericarp* enclosed within the spatha, membranous, rounded or slightly compressed, tapering to a point. *Seeds* numerous, attached to the inside of the pericarp by small filiform *stalks.*

[I quite agree with Dr. Wight in considering this to be a true *Vallisneria,* although the stem is elongated, and the flowers sessile. The same gentleman observes that all the four *Vallisneriæ* of Dr. Roxburgh (*V. alternifolia, octandra Fl. Corom. v.* 2. *t.* 165, *V. verticillata* * and *spiraloides,*) differ very much in their fructification from each other. Figures of them all will soon be provided for the present Work.

V. alternifolia seems to be a frequent plant in many parts of India, particularly in Madras and about Calcutta, growing in pools of fresh water, and flowering during the rainy season. In Hindostanee it is called *Jangi* (*Naidulpanee* in the Tamul, *Dr. Wight*); and according to the late Dr. Hamilton,† it is used for the purpose of refining sugar. "It is well known," says this author, "that one of the most common processes for refining sugar, is by filtering water slowly through small quantities of it, contained in

* Probably the *Serpicula verticillata,* Roxb. Corom. v. 2. t. 164.

† In Brewster's *Journal of Science, v.* 1. *p.* 34.

pots, with an aperture in the bottom. The water carries along with it the extractive, and the minute saccharine particles united with it, which constitute what is called *treacle*, and leaves behind the pure chrystalline sugar. In our West India Islands, the water is supplied by a cake of moist clay, placed on the surface of the sugar: but in India it is supplied by covering the upper surface with a layer of *Vallisneria alternifolia*." Other aquatic weeds, indeed, are employed, but a preference seems to be given to the latter, in consequence of its great abundance, as "it grows in every pond in India that is kept clear of weeds."—*H.*]

Suppl. Tab. XI. *Fig.* 1, Part of a female plant:—*natural size. Fig.* 2, Part of a male plant, do. *Fig.* 3, Spatha of male flowers. *Fig.* 4, Male flower. *Fig.* 5, Female flower. *Fig.* 6, Section of a nearly ripe germen. *Fig.* 7, Portion of a leaf:—*more or less magnified.*

XII.
MUCUNA MONOSPERMA.

Diadelphia Decandria. Nat. Ord. Leguminosæ. *Juss.*

Gen. Char. *Cal.* campanulatus, bilabiatus, labio inferiore trifido laciniis acutis, media productiore, labio super. latiore integro obtuso. *Corollæ vexillum* adsurgens alis carinaque brevius, *alæ* oblongæ carinæ longitud., *carina* oblonga recta acuta. *Stam.* diadelpha, *antheris* 5 oblongo-linearibus, 5 ovatis hirsutis. *Legumen* oblongum torosum bivalve septis cellulosis. *Semina* subrotunda hilo lineari circulariter cincta.—Herbæ *aut* frutices *longe scandentes.* Folia *pinnato-trifoliolata.* Racemi *axillares fructiferi sæpe penduli.* Legumina *sæpius hispida pilis innumeris fragilissimis cutem facile penetrantibus et ideo urentia. DC.*

Mucuna *monosperma;* floribus racemosis ternatis, leguminibus reniformi-orbicularibus transversim lamellosis urentibus monospermis, foliolis ramulisque pilis rufis deciduis hispidis. (Suppl. Tab. XII.)

Mucuna monosperma. *De Cand. Prodr. v.* 2. *p.* 406, (*non descripta.*)

Carpopogon monospermum. *Roxb. Hort. Beng. p.* 54.

Dolichos urens. *Roxb. Drawing in Mus. of E. Ind. C.*

A twining *Shrub*, the *stem* of which sometimes exceeds the thickness of a man's arm, and is covered with rough brown *bark*. The larger *branches* are often flattened, and sometimes two are combined together. On the year-old branches, the *flowers* are produced. The *ramuli* of the season are terete, green, and villous. *Petioles* long, slender, usually coloured, pubescent, swollen at the base, the swollen part covered with ferruginous hairs. *Leaves* ternate: *leaflets* petiolulate, elliptical-ovate, triplinerved, reticulated, entire, hairy, especially beneath on the ribs, hairs deciduous; the lateral pair externally dilated. *Stipules* of the leaflets subulate. *Peduncles* axillary or springing directly from a branch, shorter than the petioles, and bearing, near the extremity, five or six large round *buds*, each producing three flowers, all forming together a large, globose, compound *raceme* or *thyrsus*. *Calyx* campanulate, 4-toothed, teeth $\frac{1}{3}$, covered with stiff, rusty hairs. *Corolla* papilionaceous; *Vexillum* short, obtuse, embracing the base of the wings and keel; *Wings* linear-oblong, bent upwards near the point, and united; *Keel* very long, straight, except near the point, where it bends suddenly at nearly a right angle, and terminates in a sharp hooked point: the *petals* of the keel are united along the edges, both above and below, hence the stamens and pistil are completely enclosed, as it were, in a bag. *Stamens* diadelphous; the very long free portions of the *filaments* alternately longer and shorter; the longer bearing rounded hairy *anthers;* the shorter, more slender, oblong, linear, glabrous ones. *Pistil: Germen* compressed, very hairy; *Style* equal in length with the stamens, villous; *Stigma* simple. *Legume* between reniform and orbicular, 2-valved, 1-celled, 1-seeded, very deeply furrowed and lamellated on the sides and edges, and beset with innumerable stiff ferruginous very fragile hairs, which readily penetrate the skin, and cause much irritation. *Seed* solitary, corresponding in form with the legume, and circumscribed by a linear scar.

This plant grows on the bank of water-courses in rich moist soil, flowering from January to about March. It is very common in the Circars, near Samul Cottah. I have, as yet, discovered only one station to the south, at Vellangarry on the bank of the *Salt River*. It is a strong twining plant, covering, with its long branches and large leaves, a great extent of surface, particularly when growing near trees, over which it has free scope to spread.

[Dr. Wight has quoted doubtfully under this, the synonym *Carpopogon monospermum* of Roxb. I possess a copy of a drawing in the Museum of the Hon. the East India Company, of the same, which bears the name of *Dolichos urens;* but that plant of Linnæus is a very different species of *Mucuna*, a native of the West Indies, and not included in the *Hortus Benghalensis*, where probably the name of *Carpopogon monospermum** was given to the same plant. It is quite unlike any described species of *Mucuna* in De Candolle's *Prodromus:* but belongs to the first division of that author, "*Legumina sulcis transversis*," where there are only two species, *M. urens* and *M. mollis*, from both which the present is at once distinguished by its one-seeded legume. The acicular hairs which so copiously cover the fruit, calyx, petioles, young branches, and even the young leaves, are of a deep and bright ferruginous colour.—*H.*]

Suppl. Tab. XII. Mucuna monosperma. *Fig.* 1, Stamens, including the pistil. *Fig.* 2, Section of a pod with seed: —*natural size.*

XIII.

MUCUNA PRURITA.

(For Class and Order, &c., see the preceding Species.)

Mucuna *prurita;* floribus thyrsoideis, leguminibus oblongo-curvatis compressis ecarinatis urentibus, foliolis subtus

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* Dr. Graham tells me that our plant is the same as the one which, in Dr. Wallich's Collection, is called "*Mucuna monosperma*," of Roxb. In our figure, the Indian artist, with the view, probably, to show the underside of the lateral leaflets, has given their petioles a twist, which brings the *lower* dilated sides uppermost, and gives an incorrect appearance to the leaf.

hirsutis, intermedio rhomboideo obtuso, lateralibus extus dilatatis. (SUPPL. TAB. XIII.)

Carpopogon pruriens. *Roxb. Hort. Beng. p.* 54.

Dolichos pruriens. *Roxb. Drawing in Mus. of E. Ind. C. n.* 284. (*an Linn. et alior.*)

Stizolobium pruriens. *Spreng. Syst. Veget. v.* 3. *p.* 252.?

Nai Corana. *Rheed. Malab. v.* 8. *p.* 61. *t.* 35.

Cacara pruritus. *Rumph. Amb. v.* 6. *p.* 393. *t.* 142.

Poonepoosikiè. *Tamul.*

Stems suffruticose, twining, branched; *branches* rounded, hairy. *Petioles* much enlarged at the base, 6–8 inches long, cylindrical, hairy. *Leaves* ternate, middle leaflet rhomboid, or rhomboideo-elliptical, obtuse, mucronate; lateral ones much dilated on the outside, and also mucronate; on short, thick, rusty, tomentose stalks; above nearly glabrous, below silvery, from short appressed white hairs: the veins very prominent beneath. *Stipules* filiform-subulate, those of the leaflets much smaller than the others. *Racemes* peduncled, axillary, pendulous, much shorter than the petioles, thyrsoid. *Flowers* large, purple. *Pedicels* in threes, short, arising from a small thick tubercle. *Calyx* pubescent, 2-lipped; upper *lip* entire, obtuse; under one 3-cleft, the lobes acute. *Corolla: Vexillum* not half the length of the keel, varying in colour from dirty-white to pale-purple; *Wings* shorter than the keel, dark purple; *Keel* cylindrical to near the end, where it suddenly curves upwards, and terminates in a sharp spinous point. *Stamens* diadelphous; *Anthers* alternately linear and globular. *Pistil: Germen* short, hairy; *Style* filiform, pubescent for its whole length; *Stigma* subcapitate. *Legume* 3–4 inches long, and bent at the extremities, three-fourths of an inch to an inch, or very nearly so, broad, slightly compressed on the valves, not at all carinated, contracted between the seeds, and hence subtorulose, entirely covered with a thick coating of erect, white, prurient * hairs, which usually turn black in drying, and

* The American *D. pruriens* is the famous *Cowhage* or *Cow-itch,* employed as a vermifuge in the West Indies.

brown in maturity. *Seeds* 4–5, oval, separated by cellular partitions, not bound by a circular linear *hilum*, but attached to a large lateral *funiculus*.

Found twining in hedges and among bushes, usually near water. In the neighbourhood of Negapatam, it is common in sandy soil. It flowers during the rainy and cool seasons, and ripens its fruit about March. It may be considered, indeed, extensively distributed over India; but nowhere perhaps so abundantly as in the Presidency of Madras. The young pods are dressed and eaten by the natives.

It would appear from a query of De Candolle, "an Planta Americana eadem certe ac Indica?" that there is some doubt as to the identity of the American and Indian plants named *Mucuna pruriens;* in my opinion not without reason, for I suspect De Candolle's character is taken from the former, and Sprengel's from the latter. The keeled legumes and acuminated leaves which distinguish the first are certainly at variance with my plant. On comparing my drawing with Woodville's plate, Tab. CLXXIII. a very remarkable difference appears in the form of the racemes, and also in their size. The form of the segments of the calyx, in his figure, is very different from those of my plant: in his, they are represented as long, subulate teeth; in mine, they are short and triangular, with their upper segment nearly a correct triangle.

[Upon a careful comparison of Dr. Wight's figure and specimens, with the figure of Jacquin, (*Americ. t.* 122,) and American individuals in my Herbarium, both from St. Vincent and from Guiana, I am inclined to agree with Dr. Wight, and to consider the American and Asiatic species to be different. In our plant the leaves are smaller, the leaflets more obtuse (not acuminated), and the middle leaflet more truly rhomboidal, the flowers are more constantly in threes, and, what affords perhaps the best character, the pods are greatly broader, compressed, free from any raised line on the back of the valve, whilst in the American *M. pruriens* the pods are much narrower, terete, and keeled on the valves. Rumphius' plate is very characteristic of our plant, and Jacquin's is equally excellent

as a representation of the American one; while Rheede's is less happy, especially in the leaves.—Under these circumstances, I trust Dr. Wight will approve of my giving the specific name already adopted in the Herbarium Amboinense, to designate the Eastern species.—*H.*]

SUPPL. TAB. XIII. *Fig.* 1, Pod. *Fig.* 2, Seed:—*natural size.*

XIV.

MUCUNA GIGANTEA.

(For CLASS, ORDER, &c. see No. XII. *Mucuna monosperma.*)

Mucuna *gigantea;* floribus ternis umbellato-racemosis, leguminibus oblongis urentibus marginibus canaliculatis bialatis. (SUPPL. TAB. XIV.)

Mucuna gigantea. *De Cand. Prodr. v.* 2. *p.* 405.

Carpopogon giganteum. *Roxb. Hort. Beng. p.* 54.

Dolichos giganteus. *Willd. Sp. Pl. v.* 3. *p.* 1041.

A large, twining, branching, leafy *shrub*, growing among trees and bushes, which it soon covers and conceals with its abundant and luxuriant foliage. *Petioles* cylindrical, swollen at the base. *Leaflets* ovate, dark-green, shining, glabrous, triplinerved at the base; the lateral ones dilated outwardly, the middle one elliptical, all slightly acuminated. *Stipules* small, setaceous, two to the terminal, and one to each of the lateral leaflets. *Peduncles* axillary, cylindrical, equalling or exceeding the petioles, thickened near the apex, and furnished with several branches, from which three rather long *pedicels* spring, bearing each a large greenish-white *flower*, forming together a globose *thyrsus. Bracteas* two, soon deciduous, attached to the base of the calyx. *Calyx* hispid, campanulate, 2-lipped, upper *lip* frequently divided; under *lip* 3-toothed. *Corolla* papilionaceous, whitish-green, but becoming black in drying: *Vexillum* nearly as long as the other petals, reflexed; *Keel* and *wings* equal, the latter enclosing the stamens and pistils until an advanced stage, when they burst from their confinement, and shortly after, the flower fades. *Stamens* and *Anthers* as described in the generic character. *Pistil: Ger-*

men hairy; *Style* longer than the stamens; *Stigma* capitate. *Legume* oblong, ovate, compressed, hispid, with numerous brown, fragile, prurient hairs, and having a deep furrow along the edge, which is bordered on each side by a prominent wing. *Seeds* 3–4, marked nearly all round with the linear *hilum.*

This is found in moist sandy soils, near the sea-coast, flowering during all the cool and rainy seasons. The beans are eaten by the natives, and esteemed both palatable and wholesome.

Suppl. Tab. XIV. Mucuna gigantea. *Fig.* 1, Vexillum. *Fig.* 2, The alæ or wings. *Fig.* 3, Carina or keel:—*natural size.*

XV.

LABLAB VULGARIS.

Diadelphia Decandria. Nat. Ord. Leguminosæ. *Juss.*

Gen. Char. *Cal.* campanulato-tubulosus 4-fidus, laciniis rectis, 3 infer. acutis, superiore latiore e duabus coalitis constante. *Corollæ vexillum* patens basi sulcato-canaliculatum 4-callosum, callis parallelis, carina angulo recto curva. *Stam.* diadelpha, decimo intra vexilli callos recepto. *Ovarii* stipes basi vaginulatus. *Stylus* compressus subtus barbatus. *Stigma* terminale. *Legumen* compresso-planum acinaciforme ad suturas tuberculoso-muricatum, intus isthmis cellulosis transversis inter semina instructum. *Semina* 4 aut abortu pauciora ovata subcompressa, callo fungoso lineari ex umbilico orto, in altera extremitate marginata.—Herbæ *volubiles.* Stipulæ *patentes.* Folia *pinnato-trifoliolata, foliolis stipellatis integris.* Racemi *pedunculati basi folium unicum gerentes, seu si mavis folio oppositi ramulo intermedio abortivo.* Pedicelli *semiverticillati.* Semina *nigra aut fusca, hilo et callo albo. DC.*

Lablab *vulgaris;* leguminibus oblongo-ventricosis acinaciformibus, pericarpio facile detractili, seminibus ovatis subcompressis, glandula basilari hemisphærica sulcata. *DC.* (Suppl. Tab. XV.)

Lablab vulgaris. "*Savi Diss.* 1821. *p.* 19. *f.* 8. *a. b. c.*" *De Cand. Prodr. v.* 2. *p.* 401.

Dolichos Lablab. *Linn. Sp. Pl. p.* 1019. *Curt. Bot. Mag. t.* 896. *Willd. Sp. Pl. v.* 3. *p.* 1037.

Dolichos purpureus. *Sm. Ex. Bot. t.* 74. *Bot. Reg. t.* 830. (an *Linn.*?)—D. Lablab, *β. De Cand.*

γ. floribus albis. *De Cand.*—D. Benghalensis. *Jacq. Hort. Vind. v.* 2. *p.* 124. *Willd. Sp. Pl. v.* 3. *p.* 1038.

A large twining annual.—*Stems* rounded, thick, and woody near the roots; herbaceous and rough towards the extremity. *Leaves* petioled, ternate; *leaflets* 3-nerved at the base, reticulate, and slightly rugose, rough above, beneath pubescent, entire, acuminated, the middle one obsoletely 3-lobed, the lateral ones spreading outwards. *Stipules* reflexed, withering. *Flowers* subverticillate, in long, distant, large, purple *racemes*, which bear a single leaf near the base. *Calyx* bibracteate, campanulate, 2-lipped; the upper lip broad, obtuse, entire, or sometimes slightly cleft at the apex; under one 3-cleft, the middle segment the longest. *Corolla* papilionaceous; *Vexillum* reflexed, emarginate, with 4 callous bodies near the base, furrowed between; *Wings* obovate, auricled at the base, with the claw slender, bent at the point; *Keel* curved upwards at a right angle, and terminating in a sharp acumen. *Stamens* diadelphous, the teeth jointed at the base, and embraced so firmly by the lower pair of protuberances of the vexillum as frequently to separate along with that petal: the free part of the filaments very slender. *Pistil* oblong, substipitate, the stipes embraced by a fleshy sheath; *Style* compressed, the edge hairy below the simple stigma. *Legume* short, broad, compressed, acinaciform, rough on both sides to the touch, in consequence of a row of prickles.

This plant is frequent in hedges which enclose cultivated grounds. It flowers during the cool and rainy seasons. Large luxuriant plants when fully in blossom are extremely showy, and continue so for a long time, in consequence of the successive expansion of their flowers.

The seeds of the purple, or wild kind, are bitter, and but little employed as an esculent—those of the white, or

cultivated variety, are, on the contrary, highly esteemed and much used.

SUPPL. TAB. XV. Lablab vulgaris. *Fig.* 1, Vexillum. *Fig.* 2, 2, The wings. *Fig.* 3, Side view of the keel. *Fig.* 4, Petals of the keel spread open. *Fig.* 5, Stamens and pistil:—slightly *magnified.* *Fig.* 6, Seed:—*natural size.*

XVI.

CROTALARIA DIGITATA.

DIADELPHIA DECANDRIA. Nat. Ord. LEGUMINOSÆ. *Juss.*

GEN. CHAR. *Cal.* 5-lobus bilabiatus, lab. sup. bi-, infer. 3-fido. *Cor. vexillum* cordatum magnum, *carina* falcato-acuminata. *Filamenta* omnia connexa, vagina sæpius superne fissa. *Stylus* lateraliter barbato-pubescens. *Legumen* turgidum, valvis ventricosis inflatum, sæpius polyspermum, pedicellatum.—Herbæ *aut* frutices. Folia *simplicia aut palmatim composita,* 3-*aut rarissime* 5-*foliolata.* Flores *sæpius flavi.* Bracteolæ *minimæ secus pedicellum aut ad basin calycis. DC.*

Crotalaria *digitata*; foliolis 5 obovatis mucronatis utrinque dense albo-tomentosis, stipulis subulatis falcatis reflexis, racemis terminalibus. (SUPPL. TAB. XVI.)

Annual, herbaceous, erect, one or two feet high. *Stems* irregularly angled, flexuose, covered with a dense, white wool. *Leaves* alternate from the flexions of the stem, even more thickly tomentose than it, and on both sides. *Petioles* rounded, longer than the *leaflets,* which are 5 in number, digitate, rarely 7, unequal, shortly petiolulated, obovate, a little retuse, mucronated, entire. *Stipules* subulate, reflexed and bending round the stem, deciduous. *Racemes* terminal, bearing many large pedicellated yellow *flowers,* each furnished with three unequal *bracteas* at the base of the pedicel, the middle larger one leaf-like, the lateral subulate ones the stipules. *Pedicel, calyx, corolla* and *legume* all glabrous.

Calyx 5-cleft, its segments acute. *Vexillum* reflexed, large, a little longer than the *wings* and *keel.* *Stamens* 10, the *filaments* all united into a tube which is cleft above, and slightly

auricled at the base. *Legume* large, inflated, stipitate, mucronate at the point, with the persistent base of the style, many-seeded. *Seeds* compressed, round, small in proportion to the size of the legume.

I received this plant, along with many others equally interesting, from Madeira, in March, 1830. It grows among the mountains of that district, flowering and ripening its seeds in the cool season.

[This very handsome species of *Crotalaria* was named "*tomentosa*" by Dr. Wight; but there being already a *C. tomentosa* of Röttler among the simple-leaved species, I have altered it to *C. digitata.* Its nearest affinity, and the only one perhaps to which it approaches, is the *C. quinquefolia* of Linn., but that is a glabrous plant, or nearly so, and has narrow-lanceolate leaflets. Both are annual, and both must have, when growing, a good deal the aspect of a *Lupine.*]

Suppl. Tab. XVI. Crotalaria digitata. *Fig.* 1, Calyx and stamens, including the pistil:—slightly *magnified. Fig.* 2, Valve of the legume, with seeds:—*natural size.*

XVII.

CALOPHYLLUM INOPHYLLUM.

Polyandria Monogynia. Nat. Ord. Guttiferæ.

Gen. Char. *Cal.* 0–2–4-sepalus coloratus. *Cor.* 4-petala, lutea. *Stam.* numerosa basi polyadelpha aut libera; *Antheræ* oblongæ. *Stylus* crassus. *Stigma* simplex aut capitatum. *Drupa* globosa aut ovata fœta nuce abortu 1-sperma, raro 2-sperma.—Arbores, folia *nervis confertis transversis parallelis distincta*; flores *racemosi. DC.*

Calophyllum *Inophyllum;* foliis obovatis sæpius emarginatis, ramulis teretibus, floribus laxe racemosis, racemis axillaribus, pedunculis 1-floris sæpius oppositis. *DC.* (Suppl. Tab. XVII.)

Calophyllum Inophyllum. *Linn. Sp. Pl. p.* 732. *Willd. Sp. Pl. v.* 2. *p.* 1159. *De Cand. Prodr. v.* 1. *p.* 562. *Spreng. Syst. Veget. v.* 2. *p.* 571.

Bintangen maritima. *Rumph. Amb. v.* 2. *p.* 211. *t.* 71.

Ponna s. Ponna-maram. *Rheed. Mal. v. 4. p. 76. t. 38.*
Pinny-marum. *Tamul.*

This grows to a fine umbrageous *tree*. *Roots* spreading near the surface, going off at nearly right angles with the trunk, large and strong. *Stem* short, thick, knotted, and in old trees very rough and cracked: the *bark* brown, tinged with green externally, internally red, and when wounded much yellow juice exudes, which concretes into a green transparent resin. *Branches* numerous and large, abounding in leafy, glabrous, rounded branchlets. *Leaves* opposite, decussate, obovato-elliptical, entire, retuse, or emarginate, glabrous, of a dark shining-green above, pale beneath, beautifully marked with fine close parallel veins, between each pair of which, when cut, a drop of thick cream-coloured juice exudes. *Flowers* numerous, white, and fragrant. *Racemes* axillary, *pedicells* opposite, decussate. *Calyx* 4-leaved, leaves obovate, obtuse, concave, white, two of them smaller. *Corolla* of four *petals*, similar to the calyx in colour and texture, and somewhat resembling it also in form, but larger. *Stamens* numerous; *filaments* short, monadelphous at the base; *anthers* oblong, at first orange-coloured, afterwards brown. *Pistil: Germen* superior: *Style* filiform, often variously bent: *Stigma* peltate, flat. *Pericarp*, a globular drupe. *Nut* 1-seeded; when mature, the fleshy part begins to wither, and the fruit drops.

This most beautiful tree is common all along this coast, as well as in Malabar, and is used in a variety of ways. The wood, which is very tough, and of a coarse, uneven grain, is much employed for ship-building; the lower part of the roots forming excellent ready-made knees. The suckers, (*stolones*,) which are numerous and straight, and also the branches possessing these qualities, are esteemed from their property of being either not liable to attacks of the white ants, or from their power of resisting them. From the seeds, a thick dark-coloured oil, fit for burning, is procured, and their withered husks are carefully collected, as a cheap and useful fuel in the preparation of shells for lime, the only material whence that useful substance is obtained near this coast. The rejected

portions of the tree are, of course, burned. It also yields a resin, but I am ignorant in what manner this is prepared: it is not used on this coast, though I think it is employed in Malabar like Copal, being nearly as pure, and found in considerable masses. The odour of the flowers is considered beneficial in relieving difficulty of respiration, caused by cold in the head.

SUPPL. TAB. XVII. Calophyllum Inophyllum. *Fig.* 1, Stamen. *Fig.* 2, Pistil:—*magnified.*

XVIII.

COCHLOSPERMUM GOSSYPIUM.

POLYANDRIA MONOGYNIA. Nat. Ord. TERNSTRŒMIACEÆ.

Trib. IV. LAPLACEÆ.

GEN. CHAR. *Cal.* 5-sepalus persistens demum reflexus; sepalis ovali-oblongis obtusis inæqualibus. *Pet.* 5 subovata apice emarginata. *Stam.* plurima, *filam.* ima basi submonadelphis? *antheris* acuminatis. *Stylus* simplex. *Capsula* ovato-globosa 5-locul. *Semina* plurima, subcochleata, lanigera.—Arbores *foliis palmatifidis, floribus flavis. DC.*

Cochlospermum *Gossypium;* foliolorum lobis integerrimis.

Cochlospermum Gossypium. *De Cand. Prodr. v.* 1. *p.* 527.

Bombax grandiflorum. *Lonn. Voy. v.* 2. *p.* 235. *t.* 133.

Bombax Gossypium. *Linn. Syst. Veget. p.* 517. *Cav. Diss. v.* 5. *p.* 297. *t.* 157.

Bombax Congo. *Burm. Ind. p.* 145.

Congo Marum. *Tamul.*

A large *tree,* with thick, smooth, furrowed, externally cinereous, internally dark reddish-brown *bark;* its *branches* large and ascending; the extreme foliaceous and floriferous branchlets smooth, tomentose, and of a pale chestnut colour; *Leaves* alternate, borne on cylindrical downy *petioles,* which are five or six inches long, 5-lobed, lobes lanceolate, acute, entire, smooth, and green above, tomentose and white beneath, veins prominent. *Panicle* terminal, bearing, during several weeks, a succession of large, bright-yellow *flowers:* at first

accompanied by very few leaves. *Calyx* pentaphyllous, the two external divisions smaller, and resembling bracteas before the expansion of the flower. *Corolla* of five large, spreading, emarginate, obovate petals. *Stamens* numerous, shorter than the petals. *Anthers* round, tapering to a point, incurved towards the centre. *Filaments* not monadelphous at the base. *Pistil: Germen* globular, furrowed, 5-celled: *Style* long, somewhat filiform, variously bent, as in most of the *Cassias: Stigma* simple. *Capsule* 5-celled, many-seeded: *Seeds* somewhat spiral.

I have only seen this tree on low ground near the coast. It is not very ornamental when in flower, for want of leaves, the absence of which gives to the whole tree a bare and shabby appearance: though each individual blossom is splendid. The flowers first expand in January and February, and are succeeded by numerous, large, dark-coloured pods, which, contrasting well with the pale shining green and white of its foliage, give to the fine green head of this tree a really beautiful effect.

Suppl. Tab. XVIII. Cochlospermum Gossypium. *Fig.* 1, Seed:—*natural size.*

XIX.

ANISOMELES OVATA.

Dydynamia Gymnospermia. Nat. Ord. Labiatæ.

Gen. Char. *Cal.* ovatus, subæqualis, 5-dentatus. *Cor.* tubo calycem subæquante, bilabiata, labio superiori abbreviato erecto integro, inferiori majore patente 3-fido. *Stam.* 4 ascendentia, e labio superiori exserta: *Antheræ longiorum* dimidiatæ, *breviorum* biloculares, loculis parallelis transversalibus. *Stylus* apice subæqualiter bifidus. *Achenia* læve. *Benth.*

Anisomeles *ovata;* foliis ovatis subcordatis crenatis, verticillis multifloris, bracteis linearibus, calycibus pilosis, glandulis inconspicuis. *Br.*

Anisomeles ovata. *Br. in Hort. Kew. ed.* 2. *v.* 3. *p.* 364. *Spreng. Syst. Veget. v.* 2. *p.* 706.

Nepeta indica. *Linn. Sp. Pl. p.* 799. (excl. syn., fide *Br.*), *Willd. Sp. Pl. v.* 3. *p.* 57.

Ballota disticha. *Linn. Mant. p.* 83. *Ait. Hort. Kew. ed.* 1. *p.* 304.

Nepeta amboinica. *Linn. Willd.* (*Spr.*)

Marrubium odoratissimum. *Burm. Zeyl. p.* 153. *t.* 71. *f.* 1.

Annual. *Stems* erect, branched; *branches* spreading, diffuse, 4-sided, angles sharp, concave, villous, with reversed hairs. *Branchlets* opposite, axillary. *Leaves* rather long, petioled, opposite, decussate, broadly subcordate, ovate, entire at the base, above crenate, covered on both sides with soft short hairs, which make them feel like velvet to the touch, dark-green above, pale beneath. *Whorls* axillary, on two or four short *peduncles;* these, in old plants, become elongated by the successive expansion of new flowers, into as many recurved secund *spikes*, each flower furnished with two linear subspathulate *bracteas*, about half the length of the calyx. *Calyx* 5-cleft, divisions acute, slightly 10-furrowed, finely transversely reticulated, particularly when held between the eye and the light, hairy, and a little glandular. *Corolla* 2-lipped; upper *lip* shorter than the stamens, entire, blunt; under one large, 3-cleft, the lateral segments smaller, reflexed, the middle one large, obcordate, with the sides bent backwards, of a fine reddish-purple colour, darker than any other part of the corolla. *Throat* hairy; bottom of the tube closed with a nectariferous scale. *Stamens: Filaments* 4, two of them a little shorter, erect, protruding from the tube, very hairy. *Anthers* dissimilar, longer pair 1-, shorter 2-celled: cells opening transversely. *Pistil: Germen* 4-parted; *Style* filiform, increasing in thickness as it ascends, terminating in a 2-cleft *stigma*. *Seeds* 4, naked, lenticular, bright shining black.

This plant is extensively distributed over India, flowering during the cool months, and ripening its seeds in March or April. It is called *Vethupudikei*, which signifies *heat-catcher*, on account of the cooling properties which it is said to possess when administered in decoction, for the relief of hot bowel complaints and dysentery.

Suppl. Tab. XIX. Anisomeles ovata. *Fig.* 1, Calyx and corolla, laid open. *Fig.* 2, Corolla, laid open. *Fig.* 3, A stamen. *Fig.* 4, Calyx and pistil. *Fig.* 5, Achenia:—*slightly magnified.*

[*To be continued.*]

ENUMERATIO FILICUM,

By R. K. Greville, LL. D., & Wm. J. Hooker.

Part I. LYCOPODINEÆ. *Sw.*

The following list of *Ferns* has been compiled principally for our own convenience. The *Icones Filicum* is indeed brought to a close with the 12th Fasciculus, the last which was contemplated; but having other illustrative works in view on the same subject, we have felt the necessity of drawing up a Catalogue of all the species to which we have access, either in our own extensive Herbaria, or through the medium of descriptions. In order to render this list more intelligible, short characters of the new kinds are added, with some remarks, where we have deemed them requisite, in a view to the more correct determination of the species.

As we have found such a Catalogue very useful to ourselves, it has occurred to us that it might also prove serviceable to others; and if it should in any way facilitate the researches of those who have undertaken the study of this beautiful family of plants, we shall not consider the labour bestowed in the preparation of it to have been in vain.

The present Number of the *Botanical Miscellany* contains the *Lycopodineæ*, a tribe than which perhaps none in the whole range of *Filices* presents greater difficulties. Of a large proportion of its published species, the characters drawn up by preceding authors have been only intended to contrast the individuals under consideration with the few previously known; and as no writer, since the time of Swartz and

Willdenow,* has attempted a careful revision of the genus, so it is obvious, that although those characters were sufficient to separate the new species from others already described, yet they by no means avail to keep them distinct from the many discovered since. Hence arises the almost impossibility of determining what particular kinds were intended by authors. Farther, they have evidently been described without a sufficiently minute examination of the exact forms of the leaves, and stipules, serratures, and texture of the foliage; without due attention having been paid to the mode of growth and ramification (which often lead to characters of great importance); without, in short, the same careful and microscopic investigation that is required for studying the *Mosses*, a family that may, in many respects, be said to be allied to them. Thus, perhaps, in the present enumeration we may have adopted, as new, many species that are already, though not accurately, defined, but whose identity it is totally out of our power to determine: while, on the contrary, there are individuals which may, with equal justice, be referred to several specific descriptions, on account of the vagueness of their characters. We do not flatter ourselves that we have avoided the faults of our predecessors; for these are, to a certain extent, inseparable from the subject on which we treat. We shall feel grateful for the correction of our friends, and for any suggestions that may lead to a more complete acquaintance with the tribe, and we shall spare no pains to render our *Filices Asiaticæ*, and *Species Filicum*, as perfect as circumstances will allow.

Although in the present list we shall seek to consult a

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* The useful *Prodromus* of M. Desvaux, in the 6th vol. of the *Annales de la Société Linnéenne de Paris*, ought perhaps to be reckoned an exception to this statement: but although that author has added several new species, yet he appears to have continued a great number of old ones, whose validity rests upon very slight grounds; and on the other hand, for want of diagnosis, (or full descriptions instead,) even those *Lycopodia* which are there first defined, cannot always be determined with certainty. It is to be regretted, that M. Desvaux has not yet given to the world a more full history of the *Ferns*, of which the memoir in question was only designed to be the forerunner.

natural arrangement, yet we do not pledge ourselves, in future, to follow the same order, either with regard to primary divisions, or the disposition of the species; for it is evident, that in examining them, as we have many yet to do, individually, in order to a full analysis and description, much more light will be thrown on this important subject, of which we shall not fail to avail ourselves.

Our Enumeration will at once show how much we are indebted to the Hon. the Court of Directors of the East India Company, and to our generous and indefatigable friend, Dr. Wallich, for a very large proportion of the hitherto undescribed species.

LYCOPODINEÆ. *Sw.*

1. PSILOTUM. *Sw.*

Capsulæ triloculares, axillares, globosæ, coriaceæ, opacæ, loculis superne rima hiantibus, semitrivalves.—Caules *dichotomo-divisi, compressi, magis minusve triquetri.* Folia *minutissima subulata,* fructifera *bracteiformia, bifida.*

1. P. triquetrum. *Sw. Syn. Fil. p.* 187.—P. floridanum. *Mich. Fl. Amer. v.* 2. *p.* 281.—Bernhardia dichotoma. *Willd. Sp. Pl. v.* 5. *p.* 56.—Hoffmannia aphylla. *Willd. in Rœm. and Ust. Bot. Mag.* 6. *p.* 17.—Lycopodium nudum. *Linn. Sp. Pl. p.* 1564. (*Plum. Fil. t.* 170. *f.* A. A.)

Var. β. * *gracile,* ramis longioribus angustioribusque. *Wall. Cat. n.* 46. (3.)

Hab. Florida; the West Indies; South America; Bourbon and Mauritius; New Holland; and the East Indies.

Var. β. Penang. *Dr. Wallich.* Rio Janeiro. *Macrae.*

2. P. complanatum. *Sw. Syn. Fil. p.* 188, *et* 414. *t.* 4. *f.* 5.—Bernhardia dichotoma. *Willd. Sp. Pl. v.* 5. *p.* 57.

Hab. Jamaica. *Swartz.* Woohahoo, in the Pacific Ocean. *Macrae.*

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* "*A Numerical List of Dried Specimens of Plants in the East India Company's Museum, Collected under the Superintendence of Dr. Wallich, of the Company's Botanic Garden at Calcutta;*" sent by Dr. Wallich, along with the collections distributed from the Hon. the East India Company's Museum.

3. P. flaccidum. *Wall. Cat. n.* 45.

Caule dichotomo aphyllo basi subtriquetro, ramis planis ancipitibus divaricatis.

HAB. Singapore. *Dr. Wallich.*—This species is justly observed by Dr. Wallich to be very near *P. complanatum* of Swartz; the branches, however, especially of barren individuals, are broader and more divaricated.

2. TMESIPTERIS. *Bernh.*

Capsulæ biloculares, axillares, transversim oblongæ, subbilobæ, coriaceæ, opacæ; loculis superne rima transversim hiantibus, subbivalvibus.—Caules *simplices, angulati, foliosi;* foliis *verticalibus, planis,* fructiferis *bipartitis.*

1. T. Tannensis. *Bernh. in Schrad. Journ. Bot.* 1800. *v.* 2. *p.* 131. *t.* 2. *f.* 5.

HAB. New Zealand (not the Island of Tanna. *Br.*) *Forster. Fraser.*

2. T. truncata. *Desv. Prod. Fil. in Ann. de la Soc. Linn. Par. v.* 6. *p.* 192.—T. Tannensis. *Labill. Fl. Nov. Holl.* 2. *p.* 105. *t.* 252. exclus. syn.—Psilotum truncatum. *Br. Prod. p.* 104.

HAB. In Van Dieman's Land. *Labillardière.* New Holland, near Port-Jackson. *Brown. Fraser.*

3. LYCOPODIUM. *Linn.*

Capsulæ uniloculares, axillares, sessiles, *aliæ* bivalves farina repletæ, *aliæ* 2–3-valves corpusculis 1–6 globosis. *Br.*

I. EXSTIPULATÆ.

A. *Capsulis axillaribus.* SELAGINES.

1. L. Selago. *Linn. Sp. Pl. p.* 1565. *Engl. Bot. t.* 233.—L. recurvum. *Willd. Sp. Pl. v.* 5. *p.* 50.

HAB. Throughout the mountainous parts of Europe, and in North America.—A variety was found by Dr. Scouler, at Observatory Inlet, on the North-West Coast of America, having more flaccid and narrower leaves, and bearing also numerous gemmæ, which give it a squarrose and very peculiar aspect.

2. L. affine. *Hook. et Grev.*

Caule erecto subsimplice vel dichotome-ramoso folioso, foliis undique divergentibus imbricatis erecto-patentibus rigido-coriaceis lanceolato-subulatis pungentibus dorso convexis margine remote ciliato-dentatis.

HAB. Mountain of Pichincha, in Peru. *Professor W. Jameson.* Caraccas. *Mr. Parker.*—This species probably holds the place, in the tropical parts of South America, which *L. Selago* does with us, having been sent about the same time from the above-mentioned stations, by Mr. Parker and Professor William Jameson. It is very nearly allied to *L. Selago*, but the stems are more elongated, and, what is of more consequence, the leaves are ciliato-dentate, especially in the Peruvian specimens.

3. L. reflexum. *Willd. Sp. Pl. v.* 5. *p.* 52. (non *Swartz.*)

HAB. South America. *Willdenow.* Guayaquil. *Hænke.*

4. L. vernicosum. *Hook. et Grev.*

Caule perbrevi erecto simplice vel dichotomo rigido, foliis lingulatis vernicoso-nitidis e basi ad apicem insigniter refractis, marginibus pallidis.

HAB. Courtallam, in the Presidency of Madras. *Dr. Wight.*—Our specimens of this curious little *Lycopodium* are from two to four inches in height, simple, or twice or thrice dichotomous, clothed with singularly refracted leaves, so glossy as to appear as if covered with a varnish. The capsules are confined to the axils of the upper leaves.

5. L. insulare. *Carm. in Trans. Linn. Soc. v.* 12. *p.* 509.

HAB. Island of Tristan d'Acunha. *Carmichael.*

6. L. crassum. *Humb. et Bonpl. in Willd. Sp. Pl. v.* 5. *p.* 50. —L. elongatum. *Sw. Syn. Fil. p.* 175. *Hook. et Grev. Ic. Fil. t.* 244.

HAB. Peru. *Humboldt* and *Bonpland.* Near Pasco, in Peru. *Mr. Cruckshanks.*—The fructification of *L. elongatum* of Swartz is unknown, but the description, as far as it goes, agrees with *L. crassum*, and we have followed Desvaux in uniting it with that species.

7. L. Saururus. *Lam. Enc. Bot. v.* 3. *p.* 625. *Bory, Itin. v.* 1. *p.* 344. *t.* 16. *f.* 1.—L. carinatum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 559. (fide *Sprengel.*)

HAB. Isle of Bourbon. *Bory de St. Vincent.*

8. L. epicæifolium. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 559.

HAB. Mauritius. *Desvaux.*

9. L. rigidum. *Sw. Syn. Fil. p.* 176. (*Plum. Fil. t.* 166. *f.* A.) —L. squarrosum. *Sw. Fl. Occid. v.* 3. *p.* 1571, (non *Syn. Fil.*)—L. bifidum. *Humb. et Bonpl. in Willd. Sp. Pl. v.* 5. *p.* 53.—L. reflexum. *Lam. Enc. Bot. v.* 3. *p.* 653. (non *Willd.*)

HAB. In the West India Islands. South America. *Humboldt* and *Bonpland.* Java. *Blume.*—A plant which we take to be a simple variety of this species, has been communicated to us by our friend Mr. Parker, who gathered it in the Island of St. Vincent. The leaves are placed more remotely on the stem, are longer and narrower, and more regularly toothed from the base to the apex.

10. L. setaceum. *Hamilt. in Don, Prod. Fl. Nep. p.* 18. (non *Lamarck.*)

HAB. Nepal. *Dr. Hamilton.*—We know nothing of this species, which does not appear to be in the East India Company's Collection.

11. L. reversum. *Presl, Reliq. Hænk. p.* 18.

HAB. Guayaquil. *Hænke.*

12. L. lucidulum. *Mich. Fl. Bor. Amer. v.* 2. *p.* 284.—L. reflexum. *Sw. Syn. Fil. p.* 175. *Schkukr, Fil. t.* 159.

HAB. North America, from Canada to the Southern States. In mountain woods, Java, very rare. *Blume.*—Desvaux refers this species, though most incorrectly, to the *L. serratum* of Thunberg. May not this last be the *L. lucidulum* of Blume?

13. L. serratum. *Thunb. Fl. Jap. p.* 341. *t.* 38. *Wall. Cat. n.* 118. *Hook. et Grev. Ic. Fil. t.* 37. (scarcely of Desvaux

who refers to the *L. lucidulum* of Michaüx, and the *L. reflexum* of Swartz.)

HAB. Japan. *Thunberg.* Nepal. *Dr. Wallich.*

14. L. Javanicum. *Sw. Syn. Fil. p.* 175, *et* 399.

HAB. Java. *Swartz. Dr. Blume.* Ceylon. *Dr. Emerson.*

15. L. Hamiltonii. *Spreng. Syst. Veget.* (*index.*)—L. obtusifolium. *Hamilt. in Don, Prod. Fl. Nep. p.* 18. *Wall. Cat. n.* 134. (non *Swartz.*)—L. ligulatum. *Wall. in Herb.* 1823.

HAB. Nepal. *Hamilton. Dr. Wallich.*

16. L. taxifolium. *Sw. Syn. Fil. p.* 175. *Hook. et Grev. Ic. Fil. t.* 131.

HAB. The West Indian Islands. St. Helena. *Swartz.* East Indies. *Dr. Wallich.*

17. L. myrsinites. *Lam. Enc. Bot. v.* 3. *p.* 654.

HAB. Hispaniola. *Lamarck.*

18. L. linifolium. *Linn. Sp. Pl. p.* 1563. (*Dill. Musc. t.* 57. *f.* 5. *Plum. Fil. t.* 166. *f.* c.)

HAB. Jamaica, Guadeloupe, and South America. *Willdenow.* Peru. *Humboldt.*

19. L. acerosum. *Sw. Fl. Ind. Occ. v.* 3. *p.* 1575.—L. verticillatum. *Sw. Syn. p.* 175. (excl. syn. *Linn.*)—L. setaceum. *Lam. Enc. Bot. v.* 3. *p.* 625. (non *Don.*)—L. filiforme. *Sw. Syn. Fil. p.* 174, *et* 398. *t.* 4 *f.* 3. *Raddi, Fil. Bras. t.* 4. *bis. f.* 1.—L. tenue. *Humb. in Willd. Sp. Pl.* 5. *p.* 55.

HAB. West Indies and the Isle of Bourbon. *Swartz.* Peru. *Humboldt* and *Bonpland.* Brazil. *Raddi.* Ridge of Pisagua, in Quito, 10,000 feet above the level of the sea. *Professor W. Jameson.* Sandwich Islands. *Willdenow. Menzies.*—We cannot help expressing our conviction that all the synonyms we have here brought together belong to one and the same species. Our specimens of what has been considered the true *L. filiforme* from the Sandwich Islands, do not differ even in habit from the *L. filiforme* of Brazil, received from Professor Raddi himself, but said by

Desvaux to be the *L. tenue* of Humboldt. Then, we possess individuals which have all the characters of *L. acerosum* in their lower part, but which pass insensibly into *L. filiforme* upwards. The form of the leaves and scales is exceedingly variable, even on the same plant, and it must be even confessed, that there is little to distinguish the smaller states of *L. dichotomum* of Swartz, from robust individuals of *L. acerosum.* We must not omit to mention that Dr. Blume has also remarked, that *L. pulcherrimum* of Wallich, (*Hook. et Grev. Ic. Fil. t.* 38.) scarcely differs from *L. dichotomum*, except in its shorter, more remote, and more obtuse leaves.

20. L. pulcherrimum. *Wall. Cat. n.* 115. *Hook. et Grev. Ic. Fil. t.* 38.

Hab. Nepal. *Dr. Wallich.*—It has been suggested by Dr. Wallich, that this plant may not be specifically distinct from the following one.

21. L. subulifolium. *Wall. Cat. n.* 114. *Hook. et Grev. Ic. Fil. t.* 49.

Hab. Nepal. *Dr. Wallich.*

22. L. dichotomum. *Sw. Syn. Fil. p.* 174.—L. Mandioccanum. *Raddi, Fil. Bras. t.* 4.—L. pithyoides. *Schlecht. et Cham. in Linnæa, v.* 5. *p.* 623.

Hab. West Indies. Brazil. *Raddi.* Trees on the mountains of Java. *Blume.*

23. L. nitens. *Schlecht. et Cham. in Linnæa, v.* 5. *p.* 623.

Hab. Xalapa, in Mexico. *Chamisso.*—Allied to *L. verticillatum.*

24. L. verticillatum. *Linn. Suppl. p.* 448. *Willd. Sp. Pl. v.* 5. *p.* 48. *Wall. Cat. n.* 119.

Hab. Isle of Bourbon. *Willdenow.* Mauritius. *Sieber. Wallich.* Courtallam, in the Presidency of Madras. *Dr. Wight.*

25. L. aloifolium. *Wall. in Cat. n.* 129.

Hab. Nulghary, in the East Indies. *Dr. Wallich.*—Dr.

Wallich, in his Catalogue, compares this plant with his *L. obtusifolium* (*L. Hamiltonii* of Sprengel, and of this Enumeration); but it is a slenderer plant, with narrow, ligulate, or almost linear leaves, which are, besides, thicker, more coriaceous, and scarcely at all nerved.

26. L. gnidioides. *Linn. Suppl. p.* 448. *Hook. et Grev. Ic. Fil. t.* 50. *Schlecht. Adum. p.* 7. *t.* 2.—L. funiculosum. *Lam. Enc. Bot. v.* 3. *p.* 649.—L. pinifolium. *Kaulf. Enum. Fil. p.* 7. (non *Blume.*)—L. flagelliforme. *Schrad.*

HAB. Island of Mauritius. *Willdenow.* Isle of Bourbon. *Sprengel.* Cape of Good Hope. *Villette.*

27. L. laxum. *Presl, Reliq. Hænk. p.* 83.

HAB. The Philippine Islands. *Hænke.*—According to Presl, this species is allied to *L. passerinoides* and *L. struthioloides.*

28. L. passerinoides. *Humb. et Kunth, Nov. Gen. p.* 41.

HAB. In Peru. *Humboldt.*

29. L. struthioloides. *Presl, Reliq. Hænk. p.* 82.

HAB. Nootka Sound, on the North-West coast of America. *Hænke.*

B. *Capsulis spicatis.* SPICATA.

* *Spicis sessilibus, indivisis.*

† *caule erecto.*

30. L. dendroideum. *Mich. Fl. Bor. Amer. v.* 2. *p.* 282. *Hook. Ex. Fl. t.* 7.

HAB. North America, from Canada to the mountainous parts of Carolina. North-West coast of America. *Menzies.*—The leaves are 4–6-fariously disposed; those on the under surface much smaller than the rest.

31. L. juniperoideum. *Sw. Syn. Fil. p.* 178, *et* 401.

HAB. In Siberia. *Swartz.*—Nearly allied to the preceding.

32. L. glaucescens. *Presl, Reliq. Hænk. p.* 81.

HAB. Peru. *Hænke.*

33. L. densum. *Labill. Nov. Holl. v.* 2. *p.* 104. *t.* 251. *f.* 1.

Hab. Van Dieman's Land. *Labillardière. Brown.* New Holland, about Port-Jackson. *Brown.* Bay of Islands, New Zealand. *Frazer.*—Among the numerous specimens we possess of this species, the barren individuals have their leaves always spreading, longer, and entire, while those of the fertile ones are appressed, scariose, and slightly lacerated at the margin.

34. L. cernuum. *Linn. Sp. Pl. p.* 1566. *Wall. Cat. n.* 130. (*Plum. Fil. t.* 165. *f.* a.)—L. marianum. *Willd. Sp. Pl. v.* 5. *p.* 31.

Var. *β. curvatum;* robustius, foliis paululum latioribus.—L. curvatum. *Sw. Syn. Fil. p.* 178.—L. convolutum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 546.

Hab. Throughout the Tropics, and countries bordering thereon. Mauritius, Penang, Singapore, Amherst, and Sylhet. *Dr. Wallich.* *β.* In Jamaica and the East Indies. *Willdenow.* Guadeloupe. *Mr. Parker.* Martinique. *Menzies. Sieber.*—Dr. Blume considers *L. curvatum* to be really distinct from *L. cernuum* in its broader leaves, patent scales, and more rigid frond.

35. L. squarrosum. *Forst. Prod. n.* 479. *Sw. Syn. Fil. p.* 177, (non *Fl. Ind. Occ.*)—L. Hippuris. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 559.—L. Forsteri. *Poir, Enc. Bot. Suppl. v.* 3. *p.* 554.

Hab. The Society Islands, and in Java. *Swartz* and *Dr. Blume.*

36. L. uliginosum. *Labill. Nov. Holl. v.* 2. *p.* 104. *t.* 251, *f.* 2.

Hab. Van Dieman's Land. *Labillardière.* New Holland, near Port-Jackson. *Brown.*

37. L. pygmæum. *Kaulf. Enum. Fil. p.* 3.—L. bryoides. *Kaulf. Enum. Fil. p.* 4.—L. pumilum. *Schlecht. Adum. p.* 6. *t.* 3.

Hab. Cape of Good Hope. *Bergius. Mund* and *Maire.*

+ + *Caule laxo vel pendulo.*

38. L. proliferum. *Blume, En. Pl. Javæ. p.* 265.

Hab. Trees on the Mountain of Gede, in Java. *Dr.*

Blume.—This is said to differ from *L. squarrosum* in the more remote and suberect leaves, and in the more lax and slender spikes.

39. L. Hookeri. *Wall. Cat. n.* 116. *Hook. et Grev. Ic. Fil. t.* 185.—L. pulcherrimum. *Wall. in Herb.* 1823.

Hab. Nepal. *Dr. Wallich.*—We fear that this fine *Lycopodium* hardly differs from *L. verticillatum*, for we possess specimens exactly intermediate between the spiked plants of *L. Hookeri*, and the ordinary state of that species. Indeed, it appears to be as variable in the characters of its fructification as *L. gnidioides.*

40. L. ulicifolium. *Sw. Syn. Fil. p.* 177.—L. acutifolium. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 559, (fide *Spreng.*)

Hab. In the East Indies. *Swartz.* Isle of Bourbon. *Sprengel.*

41. L. Flagellaria. *Bory, in Duperr. Voy. v.* 1. *p.* 248. *t.* 26.

Var. β. *minus;* caule breviore magis rigido, foliis subulatis carinatis.—L. acrostachyum. *Wall. Cat. n.* 117. *Hook. et Grev. Ic. Fil. t.* 181.

Hab. α. New Ireland, and Offack, in the Papouan Groupe. *Durville.* α. and β. Singapore. *Dr. Wallich. Finlayson.*—Since the publication of the *L. acrostachyum* in the *Icones Filicum*, we have received larger specimens of this plant, which convince us that it is the same species with the *L. Flagellaria* of *Duperrey's Voyage;* hence we have been led to make our *L. achrostachyum* the variety β.

42. L. tetragonum. *Hook. et Grev. Ic. Fil. t.* 109.

Hab. On Pichincha, in Peru. *Professor W. Jameson.*

+ + + *Caule repente.*

43. L. annotinum. *Linn. Sp. Pl. p.* 1566. *Engl. Bot. t.* 1727. L. juniperifolium. *Lam. Fl. Fr. v.* 1. *p.* 33.

Hab. Europe, Asia, and North America. North-West coast of America. *Dr. Scouler.* Unalaschka, in Kotzebue's Sound. *Chamisso. Messrs. Lay and Collie.*

44. L. vulcanicum. *Blume, Enum. Pl. Jav. p.* 266.

Hab. Margins of the craters of volcanic mountains, in Java. *Dr. Blume.*—Allied to *L. curvatum* of Swartz, (our *L. cernuum*, var.), but differing, according to Blume, in its rooting stem, often bifid spikes, and in the flat and less patent scales.

45. L. sabinæfolium. *Willd. Sp. Pl. v.* 5. *p.* 20.

Caule elongato repente, ramis erectis brevibus dense fastigiatim dichotome divisis, foliis undique imbricatis nunc quadrifariis erectis tereti-subulatis aristato-acuminatis, spicis sessilibus cylindraceis solitariis, squamis cordato-acuminatis patentibus integerrimis.—L. alpinum. *Mich. Fl. Bor. Amer. v.* 2. *p.* 282.—L. armatum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 544.

Hab. In Canada. *Michaux.* Banks of the Saskatchawan. *Richardson* and *Drummond.* Java. *Dr. Blume.*—This *Lycopodium* seems to be extremely rare in Canada. We ourselves never saw specimens until they were collected in Captain Sir John Franklin's Second Journey. In habit and fructification it almost exactly resembles *L. alpinum;* but the leaves in, their insertion, form, and direction, are totally different; the spikes, too, are smaller, and more slender. The true *L. alpinum* has only recently been found in America, upon the Rocky Mountains. *L. sabinæfolium* has probably never hitherto been seen by any other author except Michaux, as all others have placed it in a wrong section. It is very extraordinary that this, which is so extremely rare in North America, should have been found on volcanic mountains in Java. May not Dr. Blume's plant be a distinct species?

46. L. diffusum. *Br. Prod. p.* 165.

Hab. Van Dieman's Land. *Brown.*

47. L. laterale. *Br. Prod. p.* 165. *Labill. Sert. Austr. Cal. p.* 10. *t.* 15.

Hab. New Holland. *Brown. Sieber.* New Caledonia. *Labillardière.*

48. L. Japonicum. *Sw. Syn. Fil. p.* 179.

Hab. In Japan. *Thunberg.*—This species was known even

to Thunberg only by imperfect specimens. The fructification has never been discovered.

49. L. phylicæfolium. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 546.

HAB. In South America. *Desvaux.*

50. L. confertum. *Willd. Sp. Pl. v.* 5. *p.* 27.

HAB. Chili. *Willdenow.* The Falkland Isles. *Sprengel.*

51. L. vestitum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 546.

HAB. South America. *Desvaux.* New Grenada. *Sprengel.*

52. L. inundatum. *Linn. Sp. Pl. p.* 1565. *Engl. Bot. t.* 239. *Schkuhr, Fil. t.* 160. *f.* D.—L. palustre. *Lam. Fl. Fr. v.* 1. *p.* 32.

HAB. Europe and North America.

53. L. longipes. *Hook. et Grev.*

Caule repente elongato ramoso, ramis sterilibus brevibus decumbentibus flaccidis, fructifero erecto elongato (pedali) rigido pedunculiformi, foliis subulatis flaccidis nitidis integerrimis rami fructiferi verticillatis sparse ciliatis, squamis folio similibus spinuloso-ciliatis.

HAB. Island of St. Catherine, Brazil. *Macrae.*—This species has the greatest affinity with *L. inundatum;* so much so indeed, that, were it not for its extraordinary size and more ciliated leaves, we should have had little hesitation in referring it to that species, although a native of the Tropics. Here the barren stems are branched, not unfrequently a foot and a half or more in length; the fructifying one, which might almost be called a leafy peduncle, is a foot, or even sixteen inches, in height.

54. L. alopecuroides. *Linn. Sp. Pl. p.* 1565. *Schkuhr, Fil. t.* 160.

HAB. The Southern States of North America.

55. L. selaginioides. *Linn. Sp. Pl. p.* 1565. *Engl. Bot. t.* 1148. —L. bryophyllum. *Presl, Reliq. Hænk. p.* 81.

HAB. Mossy pastures of the North, and the alpine regions of the South of Europe. Canada. *Michaux.* Nootka Sound. *Hænke.*

56. L. rupestre. *Linn. Sp. Pl. p.* 1564. *Schkuhr, Fil. t.* 165.—(*Wall. Cat. n.* 2188, sub nomine " *L. bryopteris*, Linn?")

Hab. Throughout North America. Abundant on the North-West coast of America. *Menzies. Douglas* and *Scouler.* Kamtschatka. *Wormskiold.* Peru. *Humboldt.* Quito. *Professor W. Jameson.* Brazil. *Raddi, Scouler.* Madras. *Dr. Shuter.* Mount Pingee. *Dr. Wallich.*—A variety is found on the North-West coast of America, by Mr. Douglas and Dr. Scouler, a foot or more in length, with the branches long, straight, of a bright green colour, and not secund at their extremities: the leaves almost quite entire in the upper part of the plant. The *L. bryopteris* of Linnæus is referred by Willdenow to his *L. circinale.*

57. L. sanguinolentum. *Linn. Sp. Pl. p.* 1567. *Amœn. Acad. v.* 2. *p.* 363. *f.* 26.

Hab. Eastern Siberia and Kamtschatka. *Willdenow.*

* * *Spicis sessilibus, divisis.* Phlegmaria.

58. L. Phlegmaria. *Linn.*

Caule dichotomo pendulo, foliis subquadrifariis alternis cordato-lanceolatis acutis nitidis integerrimis subpedicellatis, squamis capsulas subæquantibus.—*Linn. Sp. Pl. p.* 1564. *Wall. Cat. n.* 133. (1–7). *Dill. Musc. t.* 61. *f.* a. b. c. *Rheed. Mal. v.* 12. *t.* 14.—L. mirabile. *Willd. Sp. Pl. v.* 5. *p.* 11.—L. australe. *Willd. Sp. Pl. v.* 5. *p.* 11.—L. myrtifolium. *Forst. Prod. n.* 485.

Hab. Malabar, Ceylon, Cochin-China, Isle of Bourbon and Philippine Islands. *Willdenow.* Mauritius, Delta of the Ganges, Penang, Singapore, and Sylhet. *Dr. Wallich.* Marianne Islands. *Chamisso. Gaudichaud.* Dusky Bay, New Zealand. *Menzies.* Tahiti. *Durville.* Coral Islands in the Pacific Ocean. *Messrs. Lay* and *Collie.*—The stems vary exceedingly, and are sometimes straight, sometimes much divaricated, marked with 6–8 elevated lines, on which the leaves are produced. The leaves vary from cordato-acute to cordato-lanceolate, or even lanceolate. In direction, they

sometimes are erecto-patent on every side, when the plant approaches *L. gnidioides;* but more generally they are horizontally patent and distichous, rarely reflexed. They are also sometimes rigid and opaque, at other times more flaccid and semipellucid. The spikes are generally much elongated, twice or thrice dichotomous, slender, divaricated or erect: occasionally, as in a specimen from the Island of Ceylon, they are short and thick, and nearly simple: in this latter instance, too, the scales are as large and as long as the fruit, and smooth; whereas, in other specimens, they are shorter than the fruit, and wrinkled.

59. L. obtusifolium. *Sw. Syn. Fil. p.* 177. (non *Hamilt. in Don, Prod. Fl. Nep. nec Wall. Cat. n.* 134.)

HAB. Mauritius. *Palisot de Beauvois.*—This species, according to Pal. de Beauvois, its original describer (under the name of *Lepidotis obtusifolia*), differs from *L. Phlegmaria* only in the decurrent and more obtuse leaves; the former character we find in the lower leaves, on our specimens of the true *L. Phlegmaria.* Blume considers this plant as allied to his *L. nummularifolium,* but remarks that it differs from that species in its erect stems and decurrent leaves.

60. L. heteroclitum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 544.

HAB. Peru. *Humboldt.* Trinidad. *Mr. Parker.* Dominica. *Dr. Kraus.*

61. L. nummularifolium. *Blume, Enum. Pl. Jav. p.* 263.—L. rotundifolium. *Herb. Roxb. in Wall. Cat. n.* 2183. *Hook. et Grev. Ic. Fil. t.* 212.

HAB. Java. *Dr. Blume.* East Indies. *Roxburgh.*

62. L. longifolium. *Sw. Syn. Fil. p.* 177.

HAB. Islands of Bourbon and Mauritius. *Swartz.*—Except in the radicating termination of the spikes, the quaternate leaves and their decurrent bases, this species scarcely seems, by the description, to be distinct from *L. Phlegmaria.*

63. L. phlegmarioides. *Gaudich. in Freyc. Voy. Bot. v.* 1. *p.* 281. *t.* 23.

HAB. Rawak, in the Molucca Islands, on the trunks of

trees.—This is assuredly very nearly allied to *L. Phlegmaria;* but the two anterior series of the quadrifarious leaves are much smaller than the rest.

64. L. quadriforiatum. *Bory, in Duperr. Voy. v.* 1. *p.* 245.

HAB. Island of St. Catherine, Brazil. *Durville.*

65. L. ericæfolium. *Presl, Reliq. Hænk. p.* 77.

HAB. Peru. *Hænke.*

66. L. ophioglossoides. *Lam. Enc. Bot. v.* 3. *p.* 646.

HAB. The Mauritius. *Lamarck.*—Can this be a variety, or rather a state of *L. gnidioides?*

67. L. polytrichioides. *Kaulf. Enum. Fil. p.* 6.

HAB. Owhyhee. *Chamisso.*

68. L. subulatum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 544.

HAB. South America. *Humboldt.*

69. L. patens. *Willd. Herb. Spreng. Syst. Veget. v.* 4. *p.* 12.

HAB. —— ?

70. L. varium. *Br. Prod. p.* 165. *Hook. et Grev. Ic. Fil. t.* 112. —L. pachystachyon. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 544.

HAB. Van Dieman's Land. *Brown.* Mount Wellington, Van Dieman's Land. *Fraser.* Tahiti. *Menzies.*

71. L. pinifolium. *Blume, Enum. Pl. Jav. p.* 264. (non *Kaulf. Enum. p.* 7.)

HAB. Trees in woods, Java. *Dr. Blume.*—Closely allied to *L. varium.*

* * * *Spicis pedunculatis.* CLAVATA.

72. L. clavatum. *Linn.*

Caule longissimo repente valde ramoso, ramis etiam decumbentibus brevibus, foliis arcte imbricatis subsecundis lineari-subulatis piliferis dentato-ciliatis, spicis oblongo-cylindraceis geminatis pedunculo subduplo brevioribus, squamis ovatis acuminatis eroso-denticulatis. *Linn. Sp. Pl. p.* 1564. *Engl. Bot. t.* 224.—L. officinale. *Neck. Meth. Musc. p.* 150.

Var. *β. monostachyon;* spica solitaria, pedunculis brevibus.

HAB. Throughout Europe. *β.* The Rocky Mountains,

north of the Smoking River, in lat. 56°. North America. *Mr. Drummond.*—The variety β. is a remarkable one. The whole plant is more compact, the leaves less dentato-ciliate, and less closely imbricated: the spikes solitary in all the specimens, and supported on a peduncle scarcely more than an inch in length.

73. L. inflexum. *Sw. Syn. Fil. p.* 179.—L. clavatum β. *Bory, Voy. v.* 2. *p.* 205.—L. ciliatum. *Sw. Syn. Fil. p.* 179.—L. trichiatum. *Sw. l. c. p.* 179.—L. trichophyes. *Spreng. Syst. Veget. v.* 4. *p.* 13.

HAB. Islands of Bourbon and Mauritius. *Bory de St. Vincent.*—This species, were it better known, would probably be found not to be distinct from *L. aristatum* or *L. divaricatum;* but being without specimens, we are unable to decide the point satisfactorily. As far as we can judge from the descriptions, the synonyms we have brought together evidently refer to the same plant.

74. L. heterophyllum. *Hook. et Grev. Ic. Fil. t.* 113. (non *Willd. et Spreng. Syst. Veget.* which is *L. Jussiæi, Desv.*)

HAB. Owhyhee. *Menzies.*

75. L. aristatum.

Caule repente longissimo, ramis erectis subfastigiatim divisis, foliis laxis patentibus nunc incurvis lineari-subulatis piliferis inferioribus denticulato-ciliatis, spicis subternis longe cylindraceis pedunculo triplo brevioribus, squamis ovatis acuminatis piliferis eroso-denticulatis. *Humb. in Willd. Sp. Pl. v.* 5. *p.* 17.—L. piliferum. *Raddi, Fil. Bras. t.* 3.—L. trichophyllum. *Desv. in Ann. Soc. Linn. Par. v.* 6. *p.* 184.—L. venustulum. *Gaud. in Freyc. Voy. v.* 1. *p.* 283. *t.* 22.—L. torridum. *Gaud. in Freyc. Voy. v.* 1 *p.* 283.

Var. β. *incurvum;* foliis rigidis incurvis. *Sieb. Flora Mixta, n.* 327.

Var. γ. *robustius;* paululum robustius.—L. clavatum. *Mich. Fl. Bor. Amer. v.* 2. *p.* 282.—L. integrifolium. *Hook. apud Goldie, in Edin. Phil. Journ.*—L. tristachyum. *Nutt. Gen.* (non *Pursh.*)

HAB. New Grenada and Peru. *Humboldt. Hænke.* Brazil.

Raddi. Jamaica. *Menzies. Mr. Lunan. Dr. Bancroft.* β. Martinique. *Sieber.* Guadeloupe. *Mr. Parker.* γ. Canada and the United States. Observatory Inlet, North-West coast of America. *Dr. Scouler.*—This differs from *L. clavatum* in its long, erect, much divided and somewhat fastigiated branches; in the narrower, more distant, and more patent leaves; rarely, and only in the lower parts of the older stems, denticulato-ciliate; and in the longer peduncles and larger spikes, which are generally three, rarely two or four.

76. L. divaricatum. *Wall. Cat. n.* 131.

Caule longissimo repente, ramis erectis valde divisis, ramulis patentibus, foliis laxiusculis patentibus anguste subulatis piliferis integerrimis, pedunculo subpedali, spicis subsenis elongato-cylindraceis alternis, squamis ovato-acuminatis piliferis demum arctissime imbricatim reflexis.

Hab. Nepal and Kamoon. *Dr. Wallich.*—A species well distinguished by the characters above enumerated.

77. L. diaphanum. *Sw. Syn. Fil. p.* 179.—L. clavatum? *Aub. du Pet. Thouars, Fl. Trist. d'Acun. p.* 30.

Hab. Island of Tristan d'Acunha. *Aubert du Petit Thouars. Carmichael.*

78. L. Preslii. *Hook. et Grev.*—L. serpens. *Presl, Reliq. Hænk. p.* 81. (non *Desv. Enc. Bot. Suppl. v.* 3. *p.* 553.)

Hab. Guayaquil. *Hænke.*—This plant is said to creep in the manner of *L. clavatum.* The branches rise only two inches above the ground; the fructification is unknown.

79. L. fastigiatum. *Br. Prod. p.* 65.

Hab. Van Dieman's Land. *Brown.*

80. L. spurium. *Willd. Sp. Pl. v.* 5. *p.* 28.

Hab. Quito. *Willdenow.*—This plant was seen by Willdenow in an imperfect state, its fructification being unknown.

81. L. paniculatum. *Desv. Encycl. Suppl. v.* 5. *p.* 543.

Hab. Marianne Islands and Chili. *Desvaux.*—This is placed in the division "*spicis dichotomis*" by Sprengel.

82. L. Magellanicum. *Bory, in Duperr. Voy. p.* 245.

Hab. Straits of Magellan. *Willdenow.* Falkland Isles. *M. M. Durville, Lesson,* and *Gaudichaud.* Tristan d'Acunha. *Carmichael.*

83. L. Carolinianum. *Linn. Sp. Pl. p.* 1567. (*Dill. Musc. t.* 62. *f.* 5.)—L. repens. *Sw. Syn. Fil. p.* 180. *Schlecht. Adum. t.* 4.—L. affine. *Bory, Voy. v.* 2. *p.* 204.

Hab. Carolina and Pennsylvania. *Swartz.* Boston, United States. *Bigelow.* Cape of Good Hope. *Mund.* Brazil. *Beyrich. Mr. Burchell.* Ceylon. *Dr. Emerson.* Madagascar. *Dr. Lyall.* Guiana. *Mr. Parker.* Isle of Bourbon. *Swartz.* Mauritius. *Pal. de Beauvois.*—Schrader appears to us to be not far from the truth in describing superficial leaves or stipules to this plant. The lower leaves are larger and distichous, the upper or smaller ones more or less imbricated, and generally curved upwards. The denticulation of the scales varies both in American and Indian specimens.

II. Stipulatæ.

A. *Ramis compressis cum foliis distichis decurrentibus coadunatis ; stipulis uniseriatis.** Complanata.

84. L. complanutum. *Linn. Sp. Pl. p.* 1567. *Schkuhr, Fil. t.* 163. *Plum. Fil. t.* 165. *f.* b.—L. tristachyon. *Pursh, Fl. Amer.* (non *Nutt.*)—L. thyoides. *Humb. in Willd. Sp. Pl. v.* 5. *p.* 18. *Blume, Enum. Pl. Jav. p.* 263.

Hab. Europe, Asia, North and South America. Peru. *Hænke.* Brazil. *Raddi.* Jamaica. *Dr. Bancroft.*—We have been unable to detect any essential difference between *L. complanatum* and *L. tristachyon.* The number of the spikes is exceedingly variable, as is the whole plant in regard to size and degree of ramification. *L. thyoides* of Humboldt, too, has all the appearance of *L. complanatum* from a warmer part

* This little groupe, although not proposed by any preceding author, appears to us to be an extremely natural one. Stipules are present, and the leaves are bifarious and distichous, as in the *Stachygynandra ;* but here the leaves and compressed branches are combined, and form, as it were, but one substance. The stipules are in one series, sometimes on the upper as well as on the under side, the former being rarely wanting.

of the world; and Chamisso assures us, that, after comparing numerous specimens, he has not succeeded in finding any real marks of distinction. If the *L. thyoides* of Blume be the same plant, of which we have our doubts, Java must be added to the stations already given.

85. L. Wightianum. *Wall. Cat. n.* 2184.

Caule repente elongato terete, ramis compressis flabelliformi-dichotomis, ramulis elongatis, foliis oppositis connato-decurrentibus subulatis patulis dorso carinatis intus canaliculatis supra nitidis, stipulis inferioribus folio minoribus, superioribus æqualibus subulatis appressis.

Hab. East Indies. *Dr. Wight.*—Our specimens of this plant are destitute of fructification, and we cannot say whether it may not be the *L. thyoides* of Blume. It is evidently allied to *L. complanatum,* but the leaves are much longer, subulate, and channelled within. At the extremity of the ramuli the leaves and stipules are almost exactly similar to each other, and quadrifariously imbricated.

86. L. Loureiri. *Desv. Prodr. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 185.—L. complanatum. *Lour. Fl. Coch. v.* 2. *p.* 338. (ed. Germ.) fide *Desvaux.*

Hab. Cochin-China. *Loureiro.*—We are entirely ignorant respecting this species.

87. L. Jussiæi. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 543.—L. heterophyllum. *Willd. Herb. in Spreng. Syst. Veget. v.* 4. *p.* 13.

Hab. Peru. *Humboldt.*—As we do not possess any specimen of this plant, we have followed the authority of Kaulfuss, who, however, has placed it, by mistake, in his division "*spicis sessilibus.*"

88. L. Hænkei. *Presl, Reliq. Hænk. p.* 78.

Hab. Peru. *Hænke.* Jamaica. *Dr. Bancroft.*—According to Presl, this is nearly allied to *L. Jussiæi,* but differs in its rounded stem, ovato-oblong acute leaves, patulous stipules, and reflexo-patent denticulated scales. Our specimen (without fructification) from Jamaica, agrees in all respects

except in the stipules, which are not uniformly obtuse. We think it may be safely referred to this place.

89. L. spectabile. *Blume, Enum. Pl. Jav. p.* 264.

HAB. Lofty mountains of Java, and of the Molucca Islands. *Dr. Blume.*—Said to come very near to *L. Jussiæi.*

90. L. drepanoides. *Blume, Enum. Pl. Jav. p.* 264.

HAB. The crater of the Mountain of Gede, in Java. *Dr. Blume.*—Nearly allied to *L. spectabile.*

91. L. alpinum. *Linn.*

Caule elongato repente, ramis erectis fastigiatim dichotome divisis, foliis quadrifariis erectis lateralibus cum ramis decurrentibus et arcte coadunatis lanceolatis inferioribus et superioribus subduplo minoribus subulato-lanceolatis e ramis magis liberis omnibus intus concavis, ramorum fertilium subæqualibus.—*Linn. Sp. Pl. p.* 1567. *Engl. Bot. t.* 234.

HAB. Throughout the alpine conntries of Europe and Northern Asia. Upon the elevated ridges of the Rocky Mountains, lat. 53°, North America, very rare. *Drummond.*

92. L. decurrens. *Br. Prod. p.* 165.

HAB. Van Dieman's Land. *Brown.*

93. L. volubile. *Forst. Prod. n.* 482. *Hook. et Grev. Ic. Fil. t.* 170.

HAB. Society Islands. *Forster.* Owhyhee. *Menzies.* New Zealand. *Baxter* and *Fraser.*

B. *Foliis distichis, stipulis biseriatis semper superioribus; (capsulis biformibus.)* STACHYGYNANDRUM. *Beauv.*

* *Ramulis cum foliis, siccitate, insigniter convolutis* (CIRCINATA.)

94. L. involvens. *Sw. Syn. Fil. p.* 182. "*Houtt. Linn. Pfl. Syst.* 13. *p.* 134. *t.* 102. *f.* 1."—L. circinale. *Thunb. Jap. p.* 34. (fide *Spreng.*)—L. depauperatum. *Desv. Enc. Suppl. v.* 3. *p.* 540. (fide *Spreng.*)

HAB. Japan and China. *Thunberg.*

95. L. circinale. *Sw.*

Caule erecto superne præcipue ramoso, foliis distichis

coriaceis ovato-acuminatis submarginatis obscure denticulatis longe aristato-piliferis, stipulis folio similibus duplo minoribus, ramulis foliisque siccitate convolutis.—*Sw. Syn. Fil. p.* 182. (non *Thunb.*) *Don, Prod. Fl. Nepal, p.* 18.? *Wall. Cat. n.* 2189.—L. Bryopteris. *Linn. Sp. Pl. p.* 1567, (fide *Willdenow.*)—L. tamariscinum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 540. (fide *Spreng.*)

Hab. East Indies. *Swartz.* Behar. *Dr. Hamilton.* (*Wallich.*)—To this place Willdenow refers the *L. Bryopteris* of Linnæus, but the expression "foliis sparsis imbricatis," in *Sp. Plant.*, is totally at variance with our plant, and Dr. Wallich is surely more correct in reducing it as a synonym to *L. rupestre.*

96. L. pallescens. *Presl?*

Caule erecto distanter ramoso, foliis distichis coriaceis ovato-subfalcatis acutis albo-marginatis margine superne pulcherrime ciliatis vix aristato-piliferis, stipulis folio similibus duplo minoribus. *Presl, Reliq. Hænk. p.* 79.?

Hab. Mexico. *Hænke. Messrs. Lay* and *Collie.*—We are doubtful whether our plant be the true *L. pallescens* of Presl, his description not being perfectly satisfactory. The circumscription of our specimen is elongated and linear.

97. L. revolutum. *Arnott.*

Caule erecto superne præcipue ramoso, foliis distichis coriaceis ovatis acutis subfalcatis immarginatis minutissime denticulatis muticis, stipulis folio minoribus.—*Arnott, in Trans. Wern. Soc. v.* 5.

Hab. Brazil. *Professor W. Jameson. Dr. Dekay.* Demerara. *Mr. Parker. Dr. Hancock.*

98. L. pulvinatum. *Hook. et Grev.*

Densissime cæspitosum, caule pinnato vel bipinnato ubique folioso, foliis arctissime imbricatis coriaceo-rigidis obliquis late ovatis mucronato-piliferis integerrimis ciliatis margine inferiore incurvo superiore fusco-membranaceo, stipulis folio simillimis erectis appressis marginibus incrassatis latere interiore ciliatis.

Hab. Kamoon. *Dr. Wallich.*—This is one of the most singular and distinct species of the genus. So closely are its leaves and stipules imbricated, and so similar are they to each other in general size and shape, that, upon looking at the upper side of the plant, they have the appearance of being *folia undique inserta;* whilst, on the opposite side, the distichous arrangement is conspicuous; and, so closely are they there applied to each other, as to resemble the coat of an *Armadillo.* These leaves, too, are different in their texture from any other species, and much like those of some *Polytricha,* or, in miniature, of some small-leaved *Aloes.*

99. L. caulescens. *Wall. Cat. n.* 137.

Caule erecto stricto inferne nudo folioso foliis arcte appressis circumvolutis superne tripinnatim ramoso, ramis primariis elongatis attenuatis, foliis oblique cordato-ovatis subfalcatis acutis minute denticulato-serratis subenerviis siccitate striatis incurvis, stipulis folio duplo minoribus late ovatis basi oblique cordatis acuminatis denticulato-serratis.

Hab. At the River Rapty, Nepal. *Dr. Wallich.*—This *Lycopodium* is remarkable for its rigid and elastic stems, which are straight, covered with leaves and stipules, exactly resembling each other, and so closely appressed, as wholly to conceal the stem. The plant is 8–12 inches high, of rather a full green colour, paler beneath. The character of *L. involvens,* as given by Swartz, shows that it is nearly allied to the present species. Our specimens, however, differ, as far as we can judge from the description, and are not convoluted in so remarkable a degree.

100. L. Yemense. *Sw. Syn. Fil. p.* 182, *et* 407. *t.* 4. *f.* 4.—L. sanguinolentum. *Forsk. Cat. Fl. Arab. p.* 125. (non *Linn.*)

Hab. Arabia Felix. *Forsköll.*

* * *Ramulis cum foliis siccitate planis.* Planifolia.

† *spicis tetragonis, squamis æqualibus.* Tetragonostachya.

+ *Caule erecto.*

101. L. crassicaule. *Hook. et Grev.*

Caule erecto crassò angulato inferne nudiusculo subaphyllo superne ramosissimo, ramis bi-tripinnatis flexuosis flaccidis, foliis remotiusculis laxis papyraceo-membranaceis subpellucidis ovato-oblongis sessilibus apice solummodo rarissime minute denticulatis siccitate subundulato-crispatis, stipulis erecto-patulis ovato-lanceolatis brevi-acuminatis basi attenuatis oblique decurrentibus subundulatis, spicis brevibus.

HAB. Mountains of Nepal. *Dr. Wallich.*—This plant was sent to us along with *L. fulcratum,* (*Wall. Cat. n.* 125,) which it resembles a good deal in size and aspect, and with which it was probably found growing. Its stems, however, are very thick at the base, throughout of a deep fulvous colour. The leaves are of a pale yellowish-green, of a thin texture, considerably undulated when dry. The stipules are lax, attenuated in their lower half, and decurrent.

102. L. fulcratum. *Hamilt. in Don, Prod. Fl. Nep. p.* 17. *Wall. Cat. n.* 125.

HAB. Mountains of Nepal. *Hamilton. Wallich.*

103. L. pubescens. *Wall. Cat. n.* 133.

Caule erecto superne ramosissimo, ramis primariis subdichotomis omnibus quasi glanduloso-pubescentibus, foliis remotis horizontalibus opacis lineari-oblongis obtusis marginibus revolutis basi decurrentibus, stipulis conformibus quadruplo minoribus erectis arcte appressis, spicis elongato-cylindraceis flexuosis.

HAB. Mountains of Irrawaddy, and near Ava, 1826. *Dr. Wallich.*—This is closely allied to *L. fulcratum,* but differs somewhat in its ramification, in its darker hue, longer spikes, and especially in its pubescent branches. Both have the leaves singularly opaque, with the margins recurved and decurrent at the base.

104. L. pennatum. *Don, Prod. Fl. Nep. p.* 18.

HAB. Nepal. *Dr. Hamilton.*

105. L. nemorum. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 186.

Hab. Java. *Desvaux.*—Desvaux remarks that this species differs from his *L. caudatum* chiefly by its oval and shorter leaves.

106. L. Wallichii. *Hook. et Grev.*

Caule erecto tereti-angulato inferne nudo aphyllo superne bipinnatim pulcherrime plumoseque ramoso, foliis inferioribus remotis squamiformibus appressis reliquis pectinatim horizontaliter patentibus rigidis subcoriaceis ovato-oblongis falcatis acutis basi brevissime auriculatis integerrimis, stipulis folio triplo minoribus acuminatissimis falcatis imbricato-patulis basi inæqualiter cordatis subauriculatis, spicis elongatis laxis.—L. elegans. *Wall. Cat. n.* 128. (non *Desv.*)

Hab. Penang and Singapore. *Dr. Wallich.*—We have much pleasure in dedicating this very graceful species to our excellent friend, Dr. Wallich. It is indeed a most distinct one. The primary branches are elongated, and so closely set with other branches as to resemble a feather. The branchlets are simple, beautifully and regularly pectinated with leaves.

107. L. argenteum. *Wall. Cat. n.* 127.

Caule erecto superne tripinnatim ramoso, pinnis primariis elongatis flaccidis, foliis fere horizontalibus subimbricatis oblongis paululum falcatis acutis obscure et late nervosis integerrimis basi superne ciliatis subtus argenteo-nitentibus nervo albido, stipulis ovato-cuspidatis minute denticulatis basi inæqualiter auriculato-cordatis barbatis, spicis——?

Hab. Mountains of Penang. *Dr. Wallich.*—This has somewhat the habit of *L. flabellatum*, but is far more flaccid and more delicately pectinated with leaves.

108. L. anceps. *Presl, Reliq. Hænk. p.* 80.

Hab. Philippine Islands. *Hænke.*—Compared by its author to *L. flabellatum.*

109. L. flabellatum. *Linn. Sp. Pl. p.* 1568.—L. gracile. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 551.—L. membranaceum. *Desv. l. c. p.* 551, (fide *Spreng.*)—(*Plum. Amer. t.* 21. *Fil. t.* 43.)

Hab. West Indies. South America. *Desvaux.*—We have been enabled, by means of specimens communicated to us by M. Desvaux, to refer his *L. gracile*, without any hesitation, to this place. Sprengel seems to us also to be correct in bringing *L. membranaceum* of the same author under *L. flabellatum*; but not equally so in regard to *L. Flabellum* of Desvaux, of which we have an authentic, though imperfect, specimen.

110. L. Pennula. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 187.

Hab. Philippine Islands. *Desvaux.*—This is brought into comparison with *L. flabellatum* by Desvaux.

111. L. Flabellum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 558.

Hab. South America. *Desvaux.*

112. L. Chilense. *Willd. Sp. Pl. v.* 5. *p.* 44. *Presl, in Reliq. Hænk. p.* 79.

Hab. Chili. *Willdenow.* Mexico, and the Vallies of the Cordilleras of Peru. *Hænke.*—According to Willdenow, this species has the habit of *L. canaliculatum*, but differs from it in the stipules and straighter spikes.

113. L. Durvillæi. *Bory, in Duperr. Voy. v.* 1. *p.* 247. *t.* 25.—L. caudatum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 558.? *Spreng. Syst. Veget. v.* 4. *p.* 20.?—Muscus fruticescens. *Rumph. Amb. v.* 6. *p.* 86. *t.* 39.

Hab. Amboyna. *Rumphius. Labillardière.* New Ireland. *Durville.* Molucca Islands. *Desvaux.*—The figure in the Herbarium Amboinense agrees extremely well with that given by Bory in Duperrey's Voyage. The *L. caudatum*, of Desvaux, arranged by that author among the little-known species, is also supposed by him to be identical with the plant of Rumphius, and we have, therefore, thought it right to quote it, but with a mark of doubt.

114. L. pellucidum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 552.

Hab. South America. *Desvaux*; who observes that this *Lycopodium* is allied to *L. canaliculatum*, and *L. Chilense.*

115. L. planum. *Desv. Enc. Bot. Suppl. v. 3. p.* 554.

Hab. East Indies. *Desvaux.*—This comes very near, indeed, (judging by the description), to the following species, being chiefly characterized by its oval leaves.

116. L. canaliculatum. *Linn.*

Caule erecto inferne nudo aphyllo superne remote folioso distiche ramoso, ramis dichotomis, foliis approximatis subimbricatis horizontaliter patentibus rigidiusculis nitidis semicordato-oblongis acutiusculis basi superne dilatatis membranaceis minute denticulatis in auriculam productis, stipulis folio triplo minoribus ovatis pungenti-acuminatis falcato-curvatis arcte imbricatis, spicis 4–8 lineas longis.—*Linn. Sp. Pl. p.* 1568. *Sw. Syn. Fil. p.* 184.—L. fruticulosum. *Bory, in Willd. Sp. Pl. v.* 5. *p.* 41.—L. cataphractum. *Willd. l. c. p.* 43.—L. cupressinum. *Willd. l. c. p.* 42.—L. tereticaulon. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 551.

Hab. Isle of Bourbon. Mauritius. Amboyna. Coromandel.—This species, to which we have adduced so many synonyms, has often been compared with *L. flabellatum* of the West Indies; but that species abundantly differs in its darker hue, in its closely pinnated, and not dichotomous branches, in the more oblique, and not horizontally patent leaves, which are beautifully ciliated at the base on the upper margin.

117. L. intermedium. *Blume, Enum. Pl. Jav. p.* 269.

Hab. Woods, Java. *Dr. Blume.*—Intermediate, according to Blume, between *L. denticulatum*, *L. umbrosum* (our *L. concinnum*), and *L. cupressinum* (our *L canaliculatum.*)

118. L. microstachyon. *Presl, Reliq. Hænk. p.* 80.—L. microstachyum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 554.?

Hab. Philippine Islands. *Hænke.*—Compared by Presl with *L. flabellatum*, and *L. cupressinum* (our *L. canaliculatum.*)

119. L. latifolium. *Hook. et. Grev.*

Caule elato erecto inferne denudato foliis squamiformibus munito basi stolonifero superne bi-tripinnatim ramoso, foliis

caulinis late ovatis reliquis oblongo-ovatis omnibus coriaceo-membranaceis paululum falcatis obtusiusculis minutissime denticulatis sessilibus basi superne subdilatatis, stipulis late obovatis sublonge mucronatis denticulatis basi paululum productis gibbosis, spicis——?

Hab. Adam's Peak, Ceylon. *Dr. Emerson.*—This fine plant is nearly two feet in height; the stem bare of branches below, but furnished with appressed leaves and stipules. The cauline leaves among the branches are horizontally patent, very broad, and the stipules remarkable for their great breadth, and for being so suddenly acuminated as to form an evident mucro. It approaches near to *L. atro-viride* in foliage, but is a much more erect plant, and of more rigid texture.

120. L. Lyallii. *Hook. et Grev.*

Caule erecto inferne nudo aphyllo teretiusculo superne ramosissimo, ramis pinnatis approximatis angulatis, foliis horizontaliter patentibus coriaceis rigidis oblongis subfalcatis brevi-acuminatis basi superiore dilatato inferiore decurrente integerrimo, stipulis lanceolato-acuminatis subcarinatis erectis strictis basi insigniter decurrentibus, spicis brevibus.

Hab. Madagascar. *Dr. Lyall,* "*n.* 265."—This species, although widely distinct from *L. pectinatum* of Willdenow, and having much smaller foliage, yet resembles it in its rigid texture, and in the general form of the leaves and stipules.

121. L. atroviride. *Wall. Herb.* 1823. *Cat. n.* 120. *Hook. et Grev. Ic. Fil. t.* 39.

Hab. Penang and Singapore. *Dr. Wallich.* Madras. *Dr. Wight. Dr. Shuter.*—There is a peculiarity in the under-side of the leaves of this *Lycopodium,* which we have not observed in any other species, namely, that on each side of the midrib, between it and the margin, there is a pale whitish line, apparently caused by the epidermis being there loosened or freed from the parenchymatous substance. The stem is rounded, and not unfrequently stoloniferous. The figure in *Dill. Musc. t.* 66. *f.* 8, (from the East Indies,) agrees with our plant in general aspect, but is far too small.

122. L. pectinatum. *Willd. Sp. Pl. v.* 5. *p.* 44. (non *Lam.*)—
L. lævigatum. *Lam. Enc. Bot. v.* 3. *p.* 652.

Hab. Madagascar. (*Willdenow.*) *Dr. Lyall,* "*n.* 255, and 269."—In one specimen in our possession, communicated by Professor Mertens from the Herbarium of Jussieu, the stipules are ovato-lanceolate; whilst in several others, communicated by Dr. Lyall, they are much smaller and lanceolato-subulate.

123. L. Parkeri. *Hook. et. Grev.*

Caule erecto acute tetragono inferne stolonifero superne ramoso folioso, ramis pinnatis, foliis inferioribus squamiformibus appressis reliquis horizontaliter patentibus pulcherrime pectinatis subnitidis rigidiusculis oblongis subfalcatis acutis basi oblique cordatis margine superiore denticulato-ciliatis, stipulis folio quintuplo minoribus lanceolato-acuminatis rectis peltatis basi productis nervo carinatis, spicis brevissimis.

Hab. Demerara. *Mr. Parker.*—One of the most elegant and distinct of this groupe, and known to us only as an inhabitant of Guiana, whence it has been sent to us by our friend, Mr. Parker. It is very possible that it may have been confounded, at least by Lamarck, with the *L. pectinatum*; for he mentions a variety from the warmer parts of South America; but it assuredly does not agree with the species under that name, as first described by Willdenow.

124. L. plumosum. *Linn. Sp. Pl. p.* 1568. *Presl, Reliq. Hænk. p.* 79. *Schkuhr, Fil. t.* 165.—L. penniforme, β. *Lam. Enc. Bot. v.* 3. *p.* 650, (fide *Desvaux.*) (*Dill. Musc. t.* 66. *f.* 9.?)

Hab. East Indies. *Willdenow.* Cordilleras of Chili. *Hænke.*

125. L. patulum. *Sw. Syn. Fil. p.* 184, *et* 411.—L. heterodonton. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 548, (fide *Sprengel.*)

Hab. Jamaica. *Swartz.*

126. L. Myosurus. *Sw. Syn. Fil. p.* 181.

Hab. Sierra Leone. *Swartz.*

127. L. scariosum. *Forst. Prod. n.* 484.

Hab. Islands of the Pacific Ocean. *Forster.*

128. L. ciliatum. *Willd. Sp. Pl. v.* 5. *p.* 38.—L. Novæ Hollandiæ. *Sw. Syn. Fil. p.* 184, *et* 410.

Hab. New Holland. *Willdenow.*

129. L. tetragonostachyum. *Wall. Cat. n.* 124.

Caule brevi erecto ad basin folioso et stolonifero bipinnatim ramoso, ramis erecto-patentibus, foliis rigidiusculis ovato-oblongis valde acutis marginatis minute denticulatis basi utrinque ciliatis, stipulis ovatis mucronato-acuminatis marginatis denticulatis basi oblique cordatis subauriculatis, spicis brevibus.

Var. *β. major;* foliis majoribus acutioribus tenuioribus, stipulis magis acuminatis.—L. semicordatum. *Wall. Cat. n.* 126. (2,) *et* (4.)—"L. semicordato an diversum?" *Wall.*—L. plumosum. *Hamilt. Herb.* (*Wall. Cat.*)—An distincta species?

Hab. Mountains of Ava. *Dr. Wallich.* *β.* Rajemahl Mountains of Hindostan. *Dr. Wallich.* Mongher. *Dr. Hamilton.* Hilly country of Madras. *Dr. Wight.*—This is an erect plant, 5–6 inches in height, bare of branches towards the base, but everywhere leafy. The leaves and stipules are furnished with a distinct though slender denticulated margin, the former ciliated at their base. The *var. β.* was suspected by Dr. Wallich to be distinct from *L. semicordatum,* though similar in the general form of its foliage.

130. L. pallidum. *Hook. et Grev.*

Caule gracili basi decumbente dein erecto folioso bipinnatim ramoso, ramis brevibus, foliis ovatis acutis rigido-membranaceis remotiusculis subtus nitidis basi oblique cordatis marginibus denticulato-serratis vetustioribus (et in axillis) duplo majoribus, stipulis folio duplo minoribus cordato-ovatis basi oblique subauriculatis setaceo-acuminatis denticulato-serratis, spicis brevibus.

Hab. Nepal. *Dr. Wallich,* 1820.—Stems about a span long; whole frond lanceolate, branching from near the base; colour a pale yellowish-green; opaque above, glossy beneath. The broad, somewhat remote, leaves, and their large size

upon the stem and primary branches, give a peculiar aspect to this plant which it is not easy to define in words.

131. L. Menziesii. *Hook. et Grev.*—L. Arbuscula. *Hook. et Grev. Ic. Fil. t.* 200. (non *Kaulfuss.*)

HAB. Owhyhee. *Menzies.* Oahu. *Messrs. Lay and Collie.*

132. L. Arbuscula. *Kaulf. Enum. Fil. p.* 19. (non *Hook. et Grev.*)

HAB. Sandwich Islands. Oahu. *Chamisso. Messrs. Lay and Collie.* Oualan and Borabora. *Durville.*

133. L. pumilio. *Br. Prod. p.* 166.

HAB. Tropical parts of New Holland. *Sir Joseph Banks, in Brown's Prod.*—The stem, according to Brown, is erect and subsimple.

+ + *Caule repente.*

134. L. concinnum. *Sw. Syn. Fil. p.* 183, *et* 408.—L. apiculatum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 551.—L. umbrosum. *Bory, in Willd. Sp. Pl. v.* 5. *p.* 36.—L. sparsifolium. *Desv. l. c. p.* 553.—L. obtusum. *Desv. l. c. p.* 548.—L. pectinatum. *Lam. Enc. Bot. v.* 3. *p.* 651.—L. viridulum. *Bory, in Willd. l. c. p.* 37.—L. falcatum. *Desv. l. c. p.* 540.

HAB. Islands of Bourbon and Mauritius.—After a careful examination of the descriptions of the above synonyms, we feel ourselves fully justified in uniting them with *L. concinnum.*

135. L. Roxburghii. *Hook. et Grev.*

Caule procumbente stolonifero vage bi-tripinnatim ramoso folioso, foliis ovato-oblongis subnitidis margine superiore denticulato basi dilatato ciliato sub-marginato, stipulis folio triplo minoribus late obovatis marginatis spinuloso-denticulatis dorso minutissime punctatis mucrone longo rigido aspero aristatis.

HAB. ——? "Herb. Roxb." *Dr. Wallich.*—In general aspect this species approaches *L. concinnum,* but the leaves are broader, more dilated in the upper margin at the base: they are distinctly ciliated, but by no means prolonged into a narrow auricle. The stipules are singularly though minutely

dotted with dark green on the upper surface, strongly ciliated at the margin, and the extremity runs out into a long, stout, rough mucro, equal in length to the stipule.

136. L. barbatum. *Kaulf. Enum. Fil. p.* 18.—L. repandum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 558, (fide *Sprengel.*)

Hab. Philippine Islands. *Chamisso.*—Hitherto Sprengel also refers the next species, but in this we have not ventured to follow him.

137. L. atrovirens. *Presl, Reliq. Hænk. p.* 79. *t.* 12. *f.* 2.

Hab. Cordilleras of Chili. *Hænke.*—Allied to *L. plumosum* and to *L. Arbuscula* of Kaulfuss, according to Presl.

138. L. stipulatum. *Blume, Enum. Pl. Jav. p.* 268.

Hab. Mountains of Java. *Dr. Blume.*—Near *L. canaliculatum*, according to Blume; it has, however, creeping stems.

139. L. inæqualifolium. *Hook. et Grev.*

Caule longissimo stolonifero tetragono sparse folioso, ramis elongatis lato-lanceolatis subplumosis bipinnatis flaccidis, foliis subnitidis fere horizontaliter patentibus approximatis oblongis acutissimis paululum falcatis sessilibus vetustioribus (ad axillas ramorum præcipue) duplo triplove majoribus obtusioribus omnibus integerrimis, stipulis ovatis cuspidato-acuminatis basi oblique subauriculatis vetustioribus magis oblongis minusque acuminatis, spicis terminalibus elongatis.—L. ornithopodioides? *Wight, in Herb.* (fide *Wall. Cat. n.* 2187.)

Hab. Madras. *Dr. Wight.* This very fine species of *Lycopodium*, which appears to extend to some feet in length, has, in the general form of the foliage and in the spikes, a very great affinity with our *L. Wallichii* (the *L. elegans* of Wall. not Desv.); but in other respects the two species are widely different. The present plant is a procumbent one, throwing out large and strong stolones. The branches, instead of being narrow and elongated and simply pinnated, are broadly lanceolate and regularly bipinnate; the leaves are far more flaccid, and the whole plant has a very remarkable appearance, from the great size of the leaves upon the stems and primary branches, as compared with those of the secondary ones.

140. L. scandens. *Sw.*

Caule longissimo scandente aphyllo stolonifero, ramis vagis subpinnatim divisis, foliis subcoriaceis nitidis patentibus cuspidatis oblongis denticulato-serratis basi subcordatis, stipulis ovatis carinatis pungenti-acuminatis denticulato-serratis paululum falcatis imbricato-patentibus basi in auriculis duabus sagittatis productis, spicis elongatis, squamis patentissimis.—*Sw. Syn. Fil. p.* 185.—L. plumosum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 540. *excl. syn.*, (fide *Desvaux.*)—Stachygynandrum scandens. *Pal. de Beauv. Fl. d'Oware, et de Ben. p.* 10. *t.* 7.?

Hab. Oware. *P. de Beauvois.* There is a peculiar rigidity in the whole of the foliage of this species. The margins of the leaves and stipules are rough with little prickles pointing forwards. The figure of Pal. de Beauvois is tolerably characteristic of our plant, and the leaf is represented with a mucro; but the description is lamentably deficient.

141. L. Willdenovii. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 552. *Hook. et Grev. Ic. Fil. t.* 57. *Wall. Cat. n.* 122. *Blume, Fl. Jav. p.* 267.—L. lævigatum. *Willd. Sp. Pl. v.* 5. *p.* 45.—

Hab. East Indies. *Willdenow.* Penang. *Dr. Wallich.* Madras. *Dr. Wight.* Java. *Dr. Blume.*

142. L. Pouzolzianum. *Gaudich. in Freyc. Voy. v.* 1. *p.* 287.

Hab. Moluccas (Pisang.) *Gaudichaud.*—Said to be allied to *L. stoloniferum, pectinatum,* and *Willdenovii.*

143. L. stoloniferum. *Sw.*

Caule longissimo repente valde ramoso per totam longitudinem hic illic stolonifero, stolonibus nitentibus, ramis dichotomis apicibus rotundatis, foliis caulinis valde remotis, ramorum approximatis, omnibus horizontaliter patentibus oblongis subfalcatis opacis flaccidis acutiusculis sessilibus apicibus margineque superiore minutissime denticulatis, stipulis late ovatis appressis rigido-acuminatis minutissime denticulatis basi oblique et inæqualiter biauriculatis.—*Sw. Syn. Fil. p.* 182. *Fl. Ind. Occ. v.* 3. *p.* 1576.—L. penniforme. *Lam. Enc. Bot. v.* 3. *p.* 650, (fide *Sprengel.*)—Muscus squamosus repens. *Plum. Fil. t.* 143.—*Dill. Musc. t.* 66. *f.* 9. A. and B. *vix f.* 10.

Hab. Jamaica and Hispaniola. *Swartz.* Demerara. *Mr. Parker.* Pichincha, in Peru. *Professor W. Jameson.*—This plant we consider to be the true *L. stoloniferum* of Swartz.

144. L. Poeppigianum. *Hook. et Grev.*

Caule elongato repente ramoso stolonifero, foliis caulinis remotis reliquis magis approximatis omnibus horizontaliter patentibus oblongo-ovatis rigidis pungenti-acutis nervo superne carinato subtus canaliculato marginibus subreflexis denticulato-asperis, stipulis ovatis pungenti-acuminatis ciliato-denticulatis basi productis peltatis.—L. stoloniferum. *Kunze, in Herb. nostr.*

Hab. Cuba. *Dr. Poeppig.*—We have received this from Dr. Kunze, under the name of *L. stoloniferum* of Swartz. In size and general habit it is more nearly allied to the following species, and is certainly quite distinct from what we consider to be the true *L. stoloniferum.* The leaves and stipules are of an exceedingly harsh and rigid texture, and the former are more ovate and pungently acute.

145. L. sulcatum. *Desv.*

Caule elongato repente ramoso stolonifero, ramis dichotomis, foliis caulinis remotis ramorum approximatis omnibus horizontaliter patentibus oblongis paululum falcatis opacis subflaccidis obtusiusculis apice margineque superiore dentato-ciliatis basi hinc auriculatis, auricula ciliata, stipulis folio duplo minoribus late ovatis acuminatis minute denticulatis basi evidenter productis et ita peltatis, spicis brevibus.—*Desv. Enc. Bot. Suppl. v.* 3. *p.* 549.—L. stoloniferum. *Raddi, Fil. Bras. t.* 2.—L. Braziliense. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 190.

Hab. Brazil. *Raddi. Douglas. Macrae.*—This is assuredly allied to *L. stoloniferum,* but it is a smaller plant; the stolones are not glossy, the leaves have a small curved, oblique, linear, ciliated auricle at the base on the upper-side, and the stipules are prolonged into one piece at the base, so as to be decidedly peltate in regard to insertion.

146. L. serrulatum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 550.

Hab. Isle of Bourbon. *Desvaux.*—Desvaux, in his arrangement, places this next to *L. stoloniferum.*

147. L. horizontale. *Presl, Reliq. Hænk. p.* 78.

Hab. Vallies of the Cordilleras of Peru. *Hænke.*—This is said to approach the *L. marginatum* of Humboldt, and is referred by Sprengel to *L. stoloniferum;* but since nothing is said of the stolones by Presl, its original describer, we have thought it safer to keep it distinct.

148. L. mnioides. *Sieb. Fl. Mixta, n.* 325.

Caule procumbente folioso stolonifero bi-tripinnatim ramoso, ramis sparsis, foliis remotiusculis ovato-oblongis vix nitidis flaccidis acutiusculis basi cordatis oblique auriculatis longissime ciliatis, stipulis folio duplo minoribus ovatis carinatis acuminato-cuspidatis ciliatis appressis paululum falcatis basi productis peltatis.

Hab. Mauritius. *Sieber.*—Ten inches to a foot long. Whole plant rather flaccid; stem tetragonous, with remote leaves; those of the branches smaller and more approximated; all of them remarkable for the long white hairs which fringe the base, and are best seen on the back of the plant.

149. L. dilatatum. *Hook. et Grev.*

Caule elongato stolonifero procumbente folioso, ramis bi-tripinnatis versus apicem caulis sensim rarioribus minoribusque, ramulis (cum foliis) ad apicem dilatatis, foliis ovato-oblongis acutiusculis sessilibus albo-marginatis omnino integerrimis, stipulis ovatis brevi-acuminatis marginatis integerrimis subfalcatis apicibus patentibus, spicis ——?

Hab. China. *Messrs. Lay and Collie.*—The stems are a foot or more in length, bearing branches which gradually become smaller and more distant towards the extremity, and leaves larger than those on the branches; the latter, taken in conjunction with the branches themselves, are broader towards their summits, giving the whole plant a peculiar aspect. The colour is a pale tender green. Fructification unknown.

150. L. marginatum. *Humb. in Willd. Sp. Pl. v.* 5. *p.* 41. *Raddi, Fil. Bras. t.* 1. *f.* 2. *Gaudich. in Freyc. Voy. v.* 1. *p.* 286, (description excellent.)—L. jungermannioides. *Gaudich. in Freyc. Voy. v.* 1. *p.* 286.?

HAB. Mexico. *Humboldt.* Peru. *Hænke.* Porto-Rico. *Sprengel.* Brazil. *Raddi. Forbes.*—Without being able to determine exactly the plant of Humboldt, we have followed Raddi, from whom we possess specimens, and whose description sufficiently accords with that of Humboldt. This is an elegant species, of a soft and silky texture, dark green above, pale beneath, stoloniferous, twice or thrice pinnatedly branched, with the branches patent, and having the stem-leaves equal in size, and equally closely placed with those of the branches. The leaves are especially ciliated at the base, where they are cordate, and, on one side, auricled.

151. L. fissidentoides. *Hook. et Grev.*

Caule repente radiculoso vage ramoso folioso, foliis subcoriaceis nitidis approximatis lineari-oblongis apice minutissime denticulatis basi superiore diaphano rotundato ciliato-denticulato, stipulis ovato-lanceolatis longe acuminatis sparse ciliatis basi in auriculam elongatam productis, spicis brevibus.

HAB. Madagascar. *Dr. Lyall*, ("267.")—This has narrower leaves than the generality of species of this division, of a rigid texture, and glossy; the whole plant does not exceed 4–6 inches in length.

152. L. remotifolium. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 190.

HAB. Philippine Islands. *Desvaux.*

153. L. cochleatum. *Hook. et Grev.*

Caule procumbente folioso, ramis sparsis dichotome divisis, foliis subcoriaceis horizontalibus cordato-ovatis obtusissimis enerviis basi superiore dilatato minute denticulato, stipulis cordato-rotundatis sessilibus alternis imbricatis convexis mucronatis mucrone oblique incurvo, spicis dichotomis, squamis cordatis convexis obtusissimis.

HAB. Ceylon. *Dr. Emerson.*—One of the most extra-

ordinary and distinct species in the whole genus. Its convex stipules, and blunt leaves and scales, give it somewhat the appearance of *Jungermannia cochleariformis*, on an enlarged scale. Our specimen is nearly a foot long.

154. L. denudatum. *Willd. Sp. Pl. v. 5. p.* 36.

HAB. West Indies. Jamaica. *Menzies. Wiles. Bancroft.*

155. L. Douglasii. *Hook. et Grev.*—L. ovalifolium. *Hook. et Grev. Ic. Fil. t.* 177. (non *Desvaux.*)

HAB. North-West coast of America. *Douglas.*

156. L. integerrimum. *Hook. et Grev.*

Caule repente radicante vage ramoso, ramis brevibus subdichotomis flaccidis, foliis approximatis oblique ovato-cordatis obtusis integerrimis, stipulis folio paululum minoribus cordatis rectis obtusis integerrimis basi oblique subauriculatis, spicis brevibus, squamis ovatis acuminatis integerrimis.

HAB. Courtallam. *Dr. Wight.*—Scarcely a span long, of a palish green colour, very flaccid; distinguished from *L. semicordatum* by its broader, more obtuse, quite entire leaves, and by the large size of the cordate stipules.

157. L. cordifolium. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 548.

HAB. Porto-Rico. *Desvaux.*

158. L. semicordatum. *Wall. Cat. n.* 126. (1,) *et* (3.)

Caule repente elongato vage et subdichotome ramoso stolonifero sparse folioso, ramis plerumque brevibus flaccidis, foliis approximatis horizontaliter patentibus oblongo-ovatis basi subobliquis sessilibus immarginatis versus apicem obscure denticulato-serratis obtusiusculis, stipulis oblongis subfalcatis acutis acutissimisve basi inæqualiter subauriculato-cordatis integerrimis, spicis breviusculis.

HAB. Rocks at the River Rapti, Nepal; and Mountains near Sylhet. *Dr. Wallich.*

159. L. sinense. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 189.

HAB. China. *Desvaux.*—Desvaux observes that it has the habit of his *L. depauperatum* (the *L. involvens* of Swartz), but that it is more slender.

160. L. radicatum. *Hook. et Grev.*

Caule decumbente subvage bipinnatim ramoso terete rigidiusculo folioso basi apiceque longe attenuato radicante, ramulis brevibus, foliis ovatis rigidiusculis acutis denticulato-serratis basi utrinque subciliatis subtus nitidiusculis, stipulis folio duplo minoribus oblique cordatis basi inæqualiter auriculatis denticulato-ciliatis tenuiter acuminatis, spicis brevibus.—L. complanatum. "*Herb. Madr.*" *in Wall. Cat. n.* 2186.

Hab. Courtallam and Dindygall. *Dr. Wight.*—From six or eight to ten inches long, rather vaguely branched, remarkable for the extremities of the stems being attenuated, bare of branches, and for their taking root with strong radicles.

161. L. nitidum. *Hook. et Grev.*

Caule repente radicante gracili flexuoso folioso, ramis remotis pinnatis bi-pinnatisve ad apicem non raro attenuatis radicantibus, foliis approximatis patentibus oblongo-ovatis rectis obtusiusculis nitidis subpellucidis denticulatis basi superiore marginatis sublonge ciliatis, stipulis imbricatis appressis ovatis subfalcatis marginatis ciliatis inferne præcipue tenui-acuminatis basi inæqualiter auriculatis, spicis brevibus, squamis marginatis denticulatis.

Hab. Jamaica. *Messrs. Wiles and Higson.*—A straggling plant with filiform stems, sparingly clothed with leaves, which are smaller than those of the branches; both stems and branches are often attenuated, and rooting at the extremities. The leaves are thin, membranous, and glossy.

162. L. ornithopodioides. *Linn. Sp. Pl. p.* 1569. (*Dill. Musc. t.* 66. *f.* 1.)

Hab. East Indies. *Linnæus.*—Desvaux observes that the *L. ornithopodioides* of Willdenow is not the species so named of Linnæus: but he gives no reason for offering this opinion, and is probably as little acquainted with the plant intended by the Swedish Naturalist as we confess ourselves to be: for he places it in a division inscribed "*denticulatio indeterminata.*" As in many other cases in this difficult genus, an

examination of an original specimen alone can determine the point at issue.

163. L. hispidum. *Willd. Sp. Pl. v. 5. p.* 35.—L. ornithopodioides. *Sw. Syn. Fil. p.* 184, (in part., fide *Willdenow.*)

HAB. West Indies. *Willdenow.* Jamaica. *Dr. MacFadyen.*

164. L. serpens. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 553. (non *Presl.*)

HAB. West Indies. *Desvaux.* Jamaica. *Dr. MacFadyen.*

165. L. tenellum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 553. (non *Don.*)

HAB. East Indies. *Desvaux.*

166. L. geniculatum. *Presl, Reliq. Hænk. p.* 80.

HAB. Philippine Islands. *Hænke.*—Fructification unknown. Its affinities are not mentioned, but it is placed by Sprengel next to *L. microstachyon.*

167. L. microphyllum. *Kunth, in Humb. et Bonpl. Nov. Gen. et Sp. v.* 1. *p.* 39.

HAB. New Grenada. *Humboldt* and *Bonpland.*

168. L. delicatulum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 554.

HAB. South America. *Desvaux.*

169. L. crassinervium. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 190.

HAB. Brazil. *Desvaux.*

170. L. didymostachyon. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 553.

HAB. Jamaica. *Desvaux.*

171. L. porelloides. *Lam. Enc. Bot. v.* 3. *p.* 652.

HAB. Antilles. *Lamarck.*

172. L. Helveticum. *Linn. Sp. Pl. p.* 1568. *Jacq. Fl. Austr. t.* 196.—L. radicans. *Schranck. Fl. Bav. n.* 1447.

HAB. Alps of the middle and south of Europe. Caucasus. *Steven.*

173. L. albidulum. *Sw. Syn. Fil. p.* 183, et 409.—L. patulum. *Gaudich. in Freyc. Voy. v.* 1. *p.* 285.—L. apodum. *Raddi, Syn. Fil. Bras. p.* 2.—L. Braziliense. *Raddi, Fil. Bras. t.* 1. *f.* 1. *fig. sup.* (non *Desv.*)

Var. *majus;* duplo majus, ramis patentissimis.—L. Braziliense. *Raddi, Fil. Bras. t.* 1. *f.* 1. *fig. inf. et fig.* 1. A.—L. pallidum. "*Beyrich?*" *Gaudich. in Freyc. Voy. v.* 1. *p.* 285.

HAB. *α.* From Canada (*Douglas*) to Pennsylvania. Brazil. *Raddi. Swainson. β.* Brazil. *Raddi. Macrae.* Pichincha in Peru. *Professor W. Jameson.*—This seems to hold an intermediate rank between *L. Helveticum* and *L. apodum.* It is paler coloured than the former, has a coarser reticulation, and more spinulose margins to the leaves, which are ovate, broader, more acute, and the stipules remarkably acuminated; the spikes shorter, with longer and more spreading scales.

174. L. apodum. *Linn. Sp. Pl. p.* 1568.—*Dill. Musc. t.* 64. *f.* 3.?

HAB. West Indies and Southern States of North America. This differs from *L. albidulum,* in its laxer and more creeping stems, more distant leaves, which are also rounder, paler, more membranaceous, less distinctly ciliated, much more coarsely reticulated, more pellucid, and furnished with a distinct slender acumen. Stipules with a more aristate point, and smaller in proportion to the size of the leaves.

175. L. pusillum. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 189.

HAB. Isle of Bourbon. *Desvaux.* Mauritius. *Bouton.*—Our specimens of this plant, which sufficiently agree with the character given by Desvaux, are of the size and have the general habit of *L. Helveticum.* The colour is dark bluish-green above, pale and almost silvery beneath; the texture of the leaves and stipules is comparatively thick and coriaceous; the leaves are furnished at the base of the upper margin with a very distinct, narrow, lunate, diaphanous auricle, which is wholly omitted in the description of Desvaux. The stipules are rather obovate than oval, with a narrow white margin, which is denticulated as well as the long reflexed and stout diaphanous terminal pair, and have two auricles at the base, one very small, the other considerably lengthened.

176. L. boreale. *Kaulf. Enum. Fil. p.* 17.

HAB. Kamtschatka. *Chamisso.*

177. L. cæspitosum. *Blume, Enum. Pl. Jav. p.* 270.

Hab. Mountain of Salak, in Java. *Dr. Blume.*—This, in some respects, is allied to *L. Helveticum*, according to Blume.

178. L. depressum. *Sw. Syn. Fil. p.* 185, *et* 412.

Hab. Cape of Good Hope. *Swartz.*

179. L. denticulatum. *Linn. Sp. Pl. p.* 1569.—*Dill. Musc. t.* 66. *f.* 1.

Hab. Southern parts of Europe. Northern Africa. *Sprengel.* Ionian Islands. *Earl of Guildford.* Madeira. *Rev. T. Lowe.* Teneriffe. *Macrae.* Cape of Good Hope. *Menzies.*

† † *Spicis compressis unilateralibus, squamis inæqualibus.*

(Platystachya.)

180. L. anomalum. *Hook. et Grev.*

Caule procumbente bi-tripinnatim ramoso folioso stolonifero, ramulis brevibus spicigeris, foliis oblongis acutis apice margineque superiore marginatis minute denticulatis basi superne dilatato ciliato, stipulis oblique cordato-ovatis cuspidatis dentato-ciliatis folio duplo minoribus, spicis brevissimis, squamis folia stipulasque æmulantibus.

Hab. Demerara. *Mr. J. Ankers, in Herb. Parker.*—Of this new species of *Lycopodium* we have only seen a specimen in Mr. Parker's Herbarium, and it is very distinct from all that we are acquainted with. The stems are from four to six inches long, regularly bipinnate, below sometimes tripinnate, the primary branches long, the secondary ones short, and bearing the spikes: all of them having equally-sized leaves, the whole of a bright green colour. The most remarkable peculiarity about this plant is, that the scales which form the resupinate spike and subtend the capsules, scarcely differ in form, size, and colour, from the leaves and stipules, of which, indeed, they are at all times a continuation; but in the other species of the *Platystachya* tribe, the scales which correspond with the stipules undergo as much change as the scales in the preceding section of the *Stachygynandra.*

181. L. tenerum. *Hook. et Grev.*

Caule breviusculo erecto flaccido inferne nudo subaphyllo superne bi-tripinnatim ramoso, foliis tenuissime membranaceis ovato-oblongis obtusis margine inferiore recto superiore basi dilatato apiceque denticulato-serratis, stipulis folio sextuplo minoribus anguste ovatis marginatis aristato-acuminatis denticulato-serratis cauli arcte appressis, spicis breviusculis laxis. —*L. ornithopodioides.* "*Herb. Madras,*" *in Wall. Cat. n.* 2186. (2.)

HAB. Courtallam. *Dr. Wight.*—Plant 6–8 inches high, remarkable for its extremely thin, pellucid, flaccid leaves, and for the small size of its stipules. The colour is a dull green, much paler beneath. At the extremities of many of the branches are what appear to be oblong *gemmæ* of a red colour and very compact substance, externally imbricated with scales, which are incorporated with the part they envelope.

182. L. chrysocaulon. *Hook. et Grev.*

Caule erecto elongato nitido rigidiusculo bipinnatim fere e basi ramoso, ramis brevibus erecto-patentibus, foliis distantibus ovato-oblongis valde acutis denticulatis basi inæqualiter cordatis, colore opaco, stipulis ovatis tenuissime acuminatis denticulatis appressis.

HAB. Mountains of Penang. *Dr. Wallich.*—Allied as this species is to *L. subdiaphanum,* it is yet unquestionably distinct. The stems are a foot to a foot and a half high, of a glossy yellow-orange colour and rigid: the leaves smaller in proportion, very acute, with the sharp points, when dry, reflexed; spikes narrower. Our specimens were communicated along with *L. argenteum.*—(*Wall. Cat. n.* 127.)

183. L. subdiaphanum. *Wall. Cat. n.* 136.

Caule erecto gracili subopaco flaccido fere e basi bipinnatim ramoso, ramis erecto-patentibus brevibus, foliis ovato-oblongis obtusis denticulatis basi inæqualiter cordatis, colore opaco, stipulis ovatis cuspidatis appressis denticulatis, squamis obtusis.

HAB. Mountains of Sylhet and Kamoon. *Dr. Wallich.*—Stem 6–8 inches high, feeble and flaccid, rarely stoloniferous at the base.

184. L. ciliare. *Retz. Obs.—Sw. Syn. Fil. p.* 185.—L. nanum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 554.—L. proniflorum. *Lam. Enc. Bot. v.* 3. *p.* 652.

Hab. Ceylon. *Willdenow. Dr. Emerson.*—This is distinguished from the other species of this groupe by its more cordate and margined leaves, by the beautifully ciliated scales of the spike, and by the larger ones being conduplicate.

185. L. reticulatum. *Hook. et Grev.*

Minimum, vage ramosum, radiculosum, foliis remotis ellipticis acutis pulcherrime reticulatis sessilibus margine superne præcipue spinuloso-denticulatis, stipulis folio duplo vel triplo minoribus ovatis acutis reticulatis denticulatis.

Hab. Mountains of Ava. *Dr. Wallich.*—This, of which only a single specimen exists in our collection, was gathered along with *L. tetragonostachyum.* (*Wall. Cat. n.* 124.) It is scarcely two inches in length, vaguely branched, the leaves lax, membranaceous, diaphanous and more reticulated than any we are acquainted with in the whole genus. The spikes are large in proportion to the size of the plant, being nearly half an inch long; the greater scales have a ciliated lamina attached to the nerve; the lesser, or stipular ones, are cordato-acuminate, strongly ciliated, and of a bright golden colour.

184. L. myosuroides. *Kaulf. Enum. Fil. p.* 19.—L. Philippense. *Willd. Herb.* (fide *Spreng.*)

Hab. Philippine Islands. *Chamisso.*

Species non satis notæ.

187. L. imbricatum. *Forsk. Fl. Ægypt. p.* 187.

Hab. Arabia. *Forskal.*

188. L. sinuosum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 558.

Hab. Isle of Bourbon. *Desvaux.*

189. L. uncinatum. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 558.

Hab. East Indies. *Desvaux.*

190. L. ovalifolium. *Desv. Enc. Bot. Suppl. v.* 3. *p.* 558. (non *Hook. et Grev. Ic. Fil.*)

HAB. New Holland. *Desvaux.*

191. L. elegans. *Desv. Prod. Fil. in Ann. Soc. Linn. Par. v.* 6. *p.* 188.

HAB. Isle of Bourbon. *Desvaux.*—Desvaux has observed that this plant differs from *L. pinnatum* in its narrower and more lax foliage; but we are not aware of any *Lycopodium* so named, except by Lamarck—a plant which Desvaux himself refers to *Jungermannia patula* of Swartz.

INFORMATION RESPECTING THE UNIO ITINERARIA.

MR. HUNNEMAN has been kind enough to send us the following intelligence concerning this useful Institution, which has just been communicated to him, in a Circular, from Professor HOCHSTETTER and Dr. STEUDEL, dated *Esslingen, Feb.* 24, 1831:—

"Agreeable to the wishes of several Members of the Society, we had, during the preceding year, announced the project of examining that part of the Pyrenées which had not been explored during the travels of 1829 and 1830. Mr. Endress will therefore set out for Paris in a few days, there to make preparations for his third and last journey to that country, and to procure information from M. Gay respecting the exact stations of the rare plants. He will hasten to Bayonne, with the view to collect the vernal plants, especially those of M. Thore in the department of the *Landes;* thence to the *Western Pyrenées;* and he will spend the summer in the *Hautes Pyrenées.*

"We flatter ourselves that the Members of our Society will take an interest in this journey: the more, since the former Pyrenæan expeditions proved so productive. For each single share, there were distributed last year nearly 180 mostly very interesting species. * Those who subscribed for double

* "If, in this collection, there should be found a few of the not rarer species amongst them, the circumstance, it is hoped, will be excused: for it is very

shares could not, consequently, receive a double number of species; but they have been indemnified by a selection of superior specimens and by numerous duplicates. Indeed, we wish it to be generally understood, that the Flora of the Pyrenées has much in common with that of the Alps, and that, therefore, many kinds which have been already forwarded to the Members of the *Unio*, will not be again collected.

"Besides the produce of the Pyrenæan journey, we have, we trust, definitively arranged with a Botanist at *Schuschi*, in *Georgia*, at the foot of the *Caucasus* and towards the confines of Persia, who will be employed in collecting for us during the present and following years. In the present season he will direct his attention to the plants of *Bieberstein's Flora Taurico-Caucasica.* The specimens already sent, as a sample, show the interesting character of the vegetation of those regions, and some of the species appear to be different from any described by Bieberstein.

"We now recommend both these undertakings to the Members of the Society; and it is earnestly requested that the subscriptions will be forwarded at an early period: for, on the one hand, it is essential that Mr. Endress be furnished with the whole sum to be expended on his journey previously to his reaching the Hautes Pyrenées; so, on the other hand, as only from 50 to 60 sets of the Georgian plants are ordered, the Members will be supplied according to the dates of their subscriptions. The subscription for the Georgian plants is only 15 florins (about 30 shillings) for each share; that for the collection of Pyrenæan plants, as before announced.

"For the year 1832, we are anxious to plan a journey to *Algiers;* presuming that the French Government will still maintain the dominion over that northern part of Africa: and we have the certain prospect of a Collector from the Unio Itineraria meeting with every encouragement towards the

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natural for a collector, destitute of the means of examination and comparison, to gather some plants as novel or scarce, which, on a closer investigation and under more favourable circumstances, he may find to be not uncommon."

accomplishment of his wishes. But as the Botanical harvest commences in that country at the Autumnal Equinox, the journey ought to begin in September of the present year, and the traveller must, previous to that period, be supplied with the necessary means. To such a country, indeed, the riches and peculiarities of whose vegetable productions may be estimated by the *Flora Atlantica* of Desfontaines, two travellers ought, if possible, to be sent, that the labour may be proportionably diminished: and we calculate their expenses at from 3000 to 4000 florins."

Those who wish to encourage this undertaking are requested to transmit their names and the number of shares they desire, before the month of June; and the subscriptions must be sent in before August. Each individual must contribute at least to the value of two shares.

As soon as it is ascertained that the number of subscribers is sufficient to warrant the sending collectors to Algiers, information to that effect will immediately be transmitted to the Members. Mr. Hunneman will, we believe, still kindly undertake to receive subscriptions for this and the other departments of the Unio Itineraria.

The Circular above-mentioned contains the correction of a few errors in regard to the naming of the Dalmatian and Pyrenæan plants of the year 1829.

1. Dalmatian Collection.

The species distributed as *Pyrus salicifolia*, L. is *P. elæagnifolia*, Pall. (*P. salicifolia*, Balb.)—Of *Campanula cordata*, Vis. and *C. muralis*, Portschl. the tickets have been, by some accident, changed. That species, allied to *C. hybrida*, L. (*Prismatocarpus*, L'Herit.) is the true *C. cordata*, Vis.

The undetermined *Crocus*, is *Crocus Pallasii*, Goldbach, according to M. Gay of Paris.

2. Pyrenæan Collection.

Fraxinus australis, Gay (of 1829), is only *F. excelsior* L. var. (A few specimens of the true *F. australis*, Gay, were gathered in the journey of 1830.)

Lavandula vera and *L. pyrenaica*, De Cand. of the collection, are both *L. pyrenaica*, De Cand.

Cynoglossum pictum, Ait. of this collection, is only *C. cheirifolium*, L.

Tamarix Africana, is *T. Gallica*, L.

Sideritis Pyrenaica from Vallée d'Eynes, is only a variety of *S. hyssopifolia*, L.—(The journey of 1830 afforded the true *S. pyrenaica*, Poir., which the subscribers will now receive.)

Statice reticulata, from the Island of St. Lucia, is a var. of *S. bellidifolia*, Gouan.

It may now be noticed, that the *Chenopodium* contained in the present collection of 1830, from the Island of St. Lucia, is not the *C. fruticosum*, as mentioned on the ticket, but the *C. trigonum*, R. and S. (*Salsola altissima*, Cav.)

OBSERVATIONS ON SOME BRITISH PLANTS, PARTICULARLY WITH REFERENCE TO THE ENGLISH FLORA OF SIR JAMES E. SMITH.

BY W. WILSON, Esq.

[*Continued from Page 143 of the present Volume.*]

NOTES *to the* SECOND VOLUME *of the* ENGLISH FLORA.

1. Chenopodium.

GEN. CHAR. *Germen* not depressed in all the species: in *C. rubrum* and *urbicum* the edge of the seed is placed vertically.

2. Chenopodium *urbicum*.—Over, Cheshire, October, 1826. —In this species, only the terminal *flower* of each axillary spike has a 5-cleft calyx, the others are mostly 3-cleft. *Seed* not depressed, but compressed, (the edge vertical,) the notch lowest within the pellicle.

3. Chenopodium *rubrum*.—Anglesea, August 21, 1828.—Edge of the *seed* vertical, the notch lowest, the pellicle

generally very loose, ovate, not turbinate. *Flowers* generally incomplete; *calyx* 4-cleft, rarely 5-cleft. *Stamens* one or two.

4. Chenopodium *acutifolium.*—Near Bangor, August 26, 1828.—Edge of the *seed* horizontal; *pellicle* or *capsule* turbinate, tightly enclosing the seed; at the base of the pellicle is fastened the umbilical cord, which lies in a groove on the edge of the seed, to which it is attached at the notch; in this instance *lateral* (not lowest.) *Seed* not distinctly dotted. *Calyx* generally 5-cleft, one or two of the *stamens* often wanting. *Stem* irregularly 4-sided.

5. Beta *maritima.*—Anglesea, July 24, 1826.—*Styles* always three: *germen* 3-sided; when the *seed* is nearly ripe, the germen becomes purple and granulated. *Flowers* often three together.

6. Salsola *Kali.*—Anglesea, August 8, 1826.

Gen. Char. *Calyx* (I believe) 5-leaved; *leaves* ovato-lanceolate, acute, keeled, the base of each overlaying the other. *Capsule* not *imbedded,* but surrounded by the calyx.—Spec. Char. *Bracteas* fringed with spinulæ. Calyx *not dilated until after the impregnation,* and without any appendage at first; although, at an early stage, the place where it originates is visible as a transverse green line, a little below the middle of each leaf of the calyx. This soon expands into a membranous, shining, unequally lobed or wavy appendage: the calyx-leaves remain erect, as at first, and not otherwise altered than in being a little dilated and more fleshy and concave within.

7. Ulmus *montana.*—May, 1827.—The seed of *U. montana* is without albumen. *Cotyledons* ovate.

8. Cuscuta *Epithymum.*—Near Holyhead, July 17, 1828.

Gen. Char. *Embryo* not horizontal, I believe, in this species, but vertically convolute, not spiral, surrounded by albumen, which also passes through the curve of the embryo. Both the skins of the seed are thick, the outer granulated or papillose.—Spec. Char. *Filaments* inserted at the top of the throat, the scales of the corolla placed below them, near the base of the throat,

or globular tube of the corolla; oblong, wider above. *Corolla* 5-cleft. *Stamens* 5. *The partition of the Capsule adheres to the lower portion* (after bursting.) Only one *bractea* visible at the base of each head of flowers; it is ovate, and of a red colour. *Stem* swelled and flattened in various parts, where tubercles are formed, which penetrate to a considerable depth the leaves of other plants; these *tubercles* have a concave surface, with a papillose margin: the *radicle* issuing from the centre.

9. Gentiana *Amarella.*—Anglesea, September 15, 1828.

Gen. Char. *Seeds* not inserted into the inflexed margin of the valves, but *near* the margins, in four lines. *Seeds* quite sphærical, and shining, chiefly consisting of albumen. *Embryo*, very small, lateral. The fringe near the base of the segments of the corolla is a beautiful object under the lens, the rays tapering and covered with prominent dots.

10. Gentiana *campestris.*—Scotland, July 24, 1827.—*Anthers* on the back of the compressed filaments, which are channelled along the inner side. *Stem* square, as also the flower-stalks. *Stem-leaves* ovato-oblong, tapering above, minutely fringed, like the segments of the calyx; radical leaves spathulate.

11. Torilis *Anthriscus.*—September 11, 1826.—The "incurved bristles" of the fruit are tapering and acute, placed in rows, between which are three dark-green ribs (rather prominent.) *Calyx-segments* smooth, nearly equal.

12. Torilis *infesta.*—Ormeshead, July 10, 1826.—*General bracteas* solitary. *Fruit* with rough spreading *hooked* bristles in rows, between which are three lines of close placed ones; the hooked extremities of the spreading bristles point upwards. *Styles* bristly at the base, so that, at first, the bristles envelope the globose *stigmas*: *styles* also green, not red, reflexed, and subsequently elongated. *Calyx-segments* unequal, the two inner ones not distinct, outer ones fringed. *Stamens* short. *Anthers* white.

13. Sium *latifolium.*—Anglesea, August 18, 1826.—Leaf-

lets *surely not acute, though pointed.* *Calyx-segments* often very narrow, like mere points. *Styles* elongated, (after flowering,) spreading, scarcely reflexed. I see no *striæ* on the half-ripe seeds, between the ribs, the spaces are very deep, but smooth; nor do I find one of the two seeds often abortive.

14. Sium *nodiflorum* and *repens.*—Examined 27th December, 1828.—*I believe these to be mere varieties of one species.*—In the herbarium of a friend, for whom I once collected specimens, I find an example which will completely unite these two supposed species. The *stem* is erect, eighteen inches long, the lower *leaves* of three pairs of ovate, moderately acute, dentato-serrate *leaflets*, scarcely more than half an inch long, with the terminal one, in some cases, confluent with the upper pair. The upper *leaves* of the *stem* with three or five roundish, coarsely toothed *leaflets*, not different from those in Dr. Hooker's specimen of "*Sium repens*," from Corsica. No general *bracteas* are present. Partial ones of a narrow ovate shape, reflexed, as long as the partial rays, 3-ribbed, with slightly membranous margins. The *umbel* of four or five rays, is raised on a stalk, a quarter of an inch long, and fully half as long as the general rays. *Styles*, in the half-ripe fruit, horizontally spreading. *Calyx* obsolete.

In the common state, *Sium nodiflorum* has the leaflets ovato-oblong, very acute, serrated, not deeply cut, an inch and a half long. The *umbel* of about twelve rays, on a short stalk about one-fourth the length of the rays. Without *general bracteas*. *Partial* ones of a narrow lanceolate shape, acute, 3-ribbed, often twice as long as the partial rays, and without a membranous border. Dr. Hooker's Corsican specimen of "*Sium repens*" exactly agrees with numerous specimens gathered in Wales, and near Warrington, in which the *general bracteas* are altogether wanting. *Sium repens* of *Engl. Fl.* is described as having them, and I was hence led to consider my small creeping specimens as mere varieties of *S. nodiflorum*, an opinion which I am by no means yet inclined to alter. For I do not think the presence of *general bracteas*, unless it should prove a constant character,

(which I very much doubt) will be sufficient to keep the *Sium repens* of *Engl. Fl.* distinct from *nodiflorum*, if unaccompanied by other marks.

15. Conium *maculatum.*—Anglesea, July 8, 1828.—*Styles* at first very short, incurved, so as to cross each other; afterwards erect and longer; finally reflexed, and widely spreading.

16. Crithmum *maritimum.*—Anglesea, August 24, 1826.—*Umbel* of eight or ten rays; partial umbels with six to twelve flowers, on very short stalks, contracted at the top. *Bracteas* ovato-lanceolate, ribbed, at first horizontally spreading, afterwards deflexed; *general bracteas* mostly six together, of equal size; *partial* ones six or seven, also equal. *Flowers* yellowish, (not white,) as well as the anthers and the base of the styles. *Petals* broadly ovate, with an incurved point, and a ridge or keel along the middle, concave and inflexed, very deciduous, falling before the anthers burst. *Calyx* obsolete. *Stamens longer than the petals*, only one or two are erect, remaining after the petals are fallen, the other stamens seem to be abortive. *Styles* tumid at the base. *Stigmas* often indistinct. *Seeds* 5-ribbed; the inner one has a prominent central rib, while the outer one appears flat and ribbed at the back; *ribs* rounded and strong, the spaces between them a little striated. The united seeds almost globular.

17. Smyrnium *Olusatrum.*—Wales, May, 1826.—*Styles* recurved, and almost recumbent on their tumid bases.

18. Hydrocotyle *vulgaris.*—Anglesea, July 4, 1828.—*Umbel* usually 5-flowered, *flowers* nearly sessile; sometimes a second umbel appears, arising from the centre of the first, elevated on a stalk. *Styles* widely spreading in the half-ripe fruit, with a tumid depressed base.

19. Statice.

Gen. Char. The *limb* of the calyx not plaited in *S. spathulata. Stigma* clavato-oblong in that and *S. Limonium.*

20. Statice *Limonium.*—Near Aberffraw, Anglesea, August

18, 1828.—*Calyx* with deep, ovato-oblong, toothed, acute, spreading segments, reflexed in the margin, with intermediate teeth. *Leaves* with a single rib, and a long recurved channelled terminal point, into which the *margin* of the leaf is excurrent. *Stem* somewhat angular, often furrowed above, with a coarse uneven skin. Lower branches of the *panicle* brittle at their union with the stem. *Anthers* yellow. *Pollen* compressed, rounded or triangular, with three pellucid dots. *Stigmas* rough, with very minute *prominent* papillæ. *Petals* almost saccate at the extremity, deeply notched. *Germen* granulated.

21. Statice *spathulata.*—Near Aberffraw, August 18, 1828. —*Limonium minus.* Raii Syn.? The leaves being "bordered down to the root, so as to have really no foot-stalks." v. *Engl. Fl. v.* 2. *p.* 117.—*Calyx* with plane, ovate, blunt, entire segments, destitute of intermediate teeth. *Leaves* with three ribs, from the very base, with a small dorsal mucro below the apex, margin of the leaf not excurrent into the mucro. *Stem* round, with an even skin. *Anthers* white. *Pollen* convex on one side, flat or concave on the other, with four or five pellucid dots. *Stigma* composed of reticulated, not prominent, vesicles. *Style* thickened upward. *Panicle* usually elongated, (not corymbose as in *S. Limonium* ;) *branches* of the panicle distichous, the lower ones sometimes abortive, which happens also in *S. Limonium. Herbage* rather glaucous, *not at all so in S. Limonium. Stems* usually erect. There are generally about three flowers together, enclosed by two or three bracteas.

22. Statice *reticulata.*—French specimen from Dr. Hooker, examined November 30, 1828.—*Leaves* 3-ribbed at the base, and along the footstalk, which is narrower than in the last. *Calyx-segments,* I believe, plicate, very broad, toothed, and pointed. *Bracteas* very broad and obtuse, with a small point, not resembling those in the last species.

23. Sibbaldia *procumbens.*—Ben Lawers, July 12, and August 17, 1827.—*Herbage* blackish-green, inclining to glaucous. *Stems* woody. The *pistils* and *stamens* are very variable in

number. I am disposed to consider it a *Potentilla.* *Seeds* slightly stalked, *receptacle* a little hairy. No separate albumen: inner skin of the *seed* purple, outer hard and bony.

24. Drosera *longifolia.*—Anglesea, July 19, 1828.—*Filaments* dilated at the top, hence the cells of the oblong anther are separated and placed at the back of the filament. *Pollen* in congregated masses of 8 or 10 globules. *Stigmas* deeply cloven. *Styles* 8, incurved. *Seeds* rough, *not winged or chaffy.* A monstrous flower was observed with one germen enclosed in another, and a third within the second; the external one open at the top and fringed with styles and abortive anthers. Rudiments of seeds lined the inner surface as usual. The inner germen had styles and anthers intermixed, and was closed at the top: the innermost more imperfectly formed, but with rudiments of styles. There were eight petals and about six perfect stamens in the flower.

Dried specimens, gathered in Cheshire, abounded with colouring matter, and stained the paper in which they were placed, after having been dried, of a deep rusty red colour, which also penetrated several contiguous sheets. *Drosera rotundifolia,* in the same sheet, was found to possess a similar property, in a much slighter degree.—November, 1828.

25. Drosera *rotundifolia.*—1822.—The *seeds* are chaffy, or tunicated, smaller than in *D. anglica.*

26. Drosera *anglica.*—Woolston Moss, near Warrington, September, 1822.—*Seeds* chaffy, very different from those of *D. longifolia. Tunic* membranous, smooth, *lax,* (in *D. longifolia* it tightly encloses the seed, and is rough or papillose.) *Embryo,* at the lower end of the seed, dicotyledonous.

27. Scilla *verna.*—Anglesea, May 7, 1828.—*Petals* somewhat slightly keeled on the inner side, with a slightly prominent line below, the keel of a deeper blue than the other parts.—*Filaments* evidently flattened, dilated below, *subulate.* The *petals* frequently oblong or lanceolate. *Flowers* sweet-scented.—Does it really differ from *Ornithogalum?*

28. Anthericum *serotinum.*—June 27, 1828.—Wales.—*Flower-stalk* invested with its own sheath, and separated by

an elongation of the root from the leaves, of which the most distant one encloses within its fleshy base the rudiment of the plant of the following season. The plant is increased by offsets, or creeping shoots, with a bulb at the extremity, the point of the bulb directed towards the parent root. For farther remarks, see *Engl. Fl. v.* 4. *p.* 265, which I have since confirmed by observation; but the lateral ribs at the back of the leaf are "one on each side of the keel," not "of the leaf." Two-flowered specimens are very unfrequent. I have seen two or three. Surely the capsule is not "membranous," nor are the seeds "few." The numerous brown sheaths investing the leaves and stem, chiefly consist of the relics of the growth of former years, each annual growth having its proper sheath enclosed by the rest, now become dead, and serving, perhaps, to protect the plant from the effects of cold. It is found on Snowdon, as well as on the rocks by Twll dû, and near the summit of Glyder Fawr; all neighbouring, but distinct situations.

29. Asparagus *officinalis. β.*—Near Llanfaelog, Anglesea.—I have examined this plant only in a cultivated state (from the situation above named.) It preserves its procumbent habit, but grows to a larger size. *Flower-stalks* jointed in the middle, where they are very apt to break off in drying, the flowers being probably abortive—(I have never seen any berries in its native situation)—the upper portion of the flower stalk rather thicker. *Corolla* divided nearly, or quite, to the base; the segments, however, as stated in *Engl. Fl.*, slightly cohering in their lower part. *Stipules* broadly ovate, solitary. No *style* visible. *Stigma* indistinct (or obsolete.)—June 11, 1827.

Having gathered specimens in flower, in its wild situation, during different years, I should say that June is the time of flowering, whatever may be stated to the contrary in *Davies' Wel. Bot.*, or elsewhere.

30. Convallaria *multiflora.*—Bradford Wood, near Cheshire, May 16, 1827, and October 17, 1826.—The *segments* of the *corolla* overlap each other, and are downy or bearded at the point, as in *C. Polygonatum.* *Style* not acutely triangular, but

like three round united columns. *Berries* bluish-black, sometimes inclining to olive, with three or four roundish seeds, (generally) surrounded by a juicy pulp. I cannot ascertain the berries to be three-celled, and the partitions, if they exist, must be pulpy externally; there are marks of three sutures, but I have not found the valves ever separated. *Embryo* very small, lateral, diametrically opposite to the scar of the seed.

31. Juncus *trifidus.*—Rocks, East of Mael Ghyrdy, August 21, 1827.—*Capsule* not at all angular, but rounded, elliptical, with a furrowed beak. *Filaments* dilated at the base. *Calyx-leaves* single-ribbed.

32. Juncus *biglumis.*—Mael Greadha, &c. July 23, 1827.—*Root* fibrous, slightly creeping. *Stems* generally solitary, sometimes two from the same root, roundish, compressed, sometimes channelled on one side, below the shortest or lower bractea, and thence to the base. *Leaves* compressed, *not channelled,* and tubular, with distant transverse partitions, but not longitudinally divided; they are much thicker than in *J. triglumis,* and the sheathing base "not much dilated." Outer *bractea* incurved or falcate. *Capsule* abrupt, wider at the top, with three rounded projections and intermediate furrows. *Stem* 1-leaved. *Flowers* two, the uppermost stalked, the other nearly sessile. *Calyx* rather shorter than the capsule. *Stigmas* longer and more slender than in *J. triglumis.*

33. Juncus *triglumis.*—July 27, 1827.—(Highlands.)—*Stems* frequently two or three from the same root, perfectly round, not channelled on one side, as in *J. biglumis,* naked above, and generally with two, sometimes with three, leaves near the base. *Leaves* with dilated sheaths, which are auricled at the top, setaceous, channelled, bitubular, with transverse partitions. Radical *leaves* also setaceous, more slender and longer than in *J. biglumis.* Sometimes four *flowers* are found together, the additional one placed lower down and separated from the rest. Outer *bractea* sometimes as large as in *J. biglumis;* each *flower* has one bractea at its base. *Calyx-leaves* more membranous than in the last, narrower, and more acute. *Capsule* longer than the *calyx,* with a tapering rather acute extremity, and with indistinctly furrowed sides; colour almost black.

The tapering summit of the capsule, dilated sheaths, and doubly tubular setaceous channelled leaves, abundantly distinguish the two flowered varieties of *J. triglumis* from *J. biglumis.*

34. Juncus *castaneus.*—Mael Greadha, &c. July 23, 1827.—*Root* slightly creeping, with short runners or lateral shoots. *Stem* hollow, round, leafy. *Leaves* hollow, channelled above, rounded at the back, the channelled side very thin and almost membranous; within are found distant transverse partitions; upper part of the leaf rounded and compressed. Heads of *flowers* often solitary. *Calyx-leaves* elliptic-lanceolate, acute, and, as mentioned in *Engl. Fl.*, 3-ribbed. *Style* breaking off at a joint. *Capsule* shining, and, as well as the *calyx* and interior *bracteas*, of a deep chocolate colour, obscurely triangular, the angles blunt, and the sides convex, almost round, nearly twice as long as the calyx. The *seeds* are obliquely attached to the edge of the partition. v. *Engl. Fl.*

35. Juncus *obtusiflorus.*—Near Bangor, July 29, 1826.—*Stems* certainly compressed, and the *leaves* slightly so, sometimes with only one leaf, generally two-leaved. *Capsule* ovate, not thickened upwards, often longer than the *calyx*, not always. The three *calyx-leaves* opposite to the sides of the *capsule*, flat, more acute, and less membranous in the margin than the rest. *Panicle* sometimes less subdivided, with twelve or more *flowers* in each head. The *panicles* of neighbouring plants are frequently so entangled together, that it is difficult to separate them.

This species is frequent in Anglesea; it grows in Cheshire, but is rare in that county.

36. Luciola *spicata.*—Ben Lawers, August 17, 1827.—Radical *leaves* with concave sides, rounded at the back, those of the stem nearly plane. *Filaments* dilated at the base, very short.

37. Tofieldia *palustris.*—Scotland, July 20, 1827.

Gen. Char. The "*calyx*" appears to be only a trifid bractea, and, if the flower be considered hexapetalous, it is separated by a stalk from this supposed calyx. If the

corolla be considered as monopetalous, the filaments are attached to the segments. I believe the germen to be solitary, and the capsule to be 3-valved, separating at the furrows.

38. Triglochin *palustre.*—September, 1826.—The *root* (in some circumstances at least) is a creeping one, sending out jointed scaly runners, bulbous at the extremity. *Leaves* hollow, very fetid when bruised.

39. Colchicum *autumnale.*—Cheshire, September 17, 1827. —*Flowers* produced at the side of the former bulb, which was once the base of the leaves, &c. of the foregoing season. Usually the new plant is attached near the base of the old bulb, but is sometimes placed higher up. As the fructification advances, the young bulb, at first indistinct, becomes enlarged, and the old one decays, the fibrous tuft of roots belonging to the new bulb. *Tube* of the corolla triangular, formed of two distinct integuments, imperfectly joined here and there: *filaments* attached to the tube, with a yellow oblong gland near their exterior base. Is not this an instance in which *calyx* and *corolla* are united? *Leaves* usually three, with tubular sheathing bases, one within the other, the inner one intimately connected with the fruit-stalks, which are about half an inch long, above the junction. The lower part I am inclined to consider as a *stem.*

40. Trientalis *europæa.*—Killin, July 24, 1827.—The number of the *segments* of the *calyx* and *corolla* vary from six to nine in the same specimen. *Filaments* attached to the corolla. The *seeds*, on their first becoming ripe, have a *green* testa, covered with the white tunic, they are of a nearly lenticular shape. The inner skin of the testa is the stoutest, and reticulated something like the tunic. *Embryo* oblong, direct, central within the albumen. The number of the calyx-segments, and those of the corolla, correspond with the number of the stamens in each flower.

[*To be continued.*]

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Holboellia ornithocephala.

TAB. LXXVII

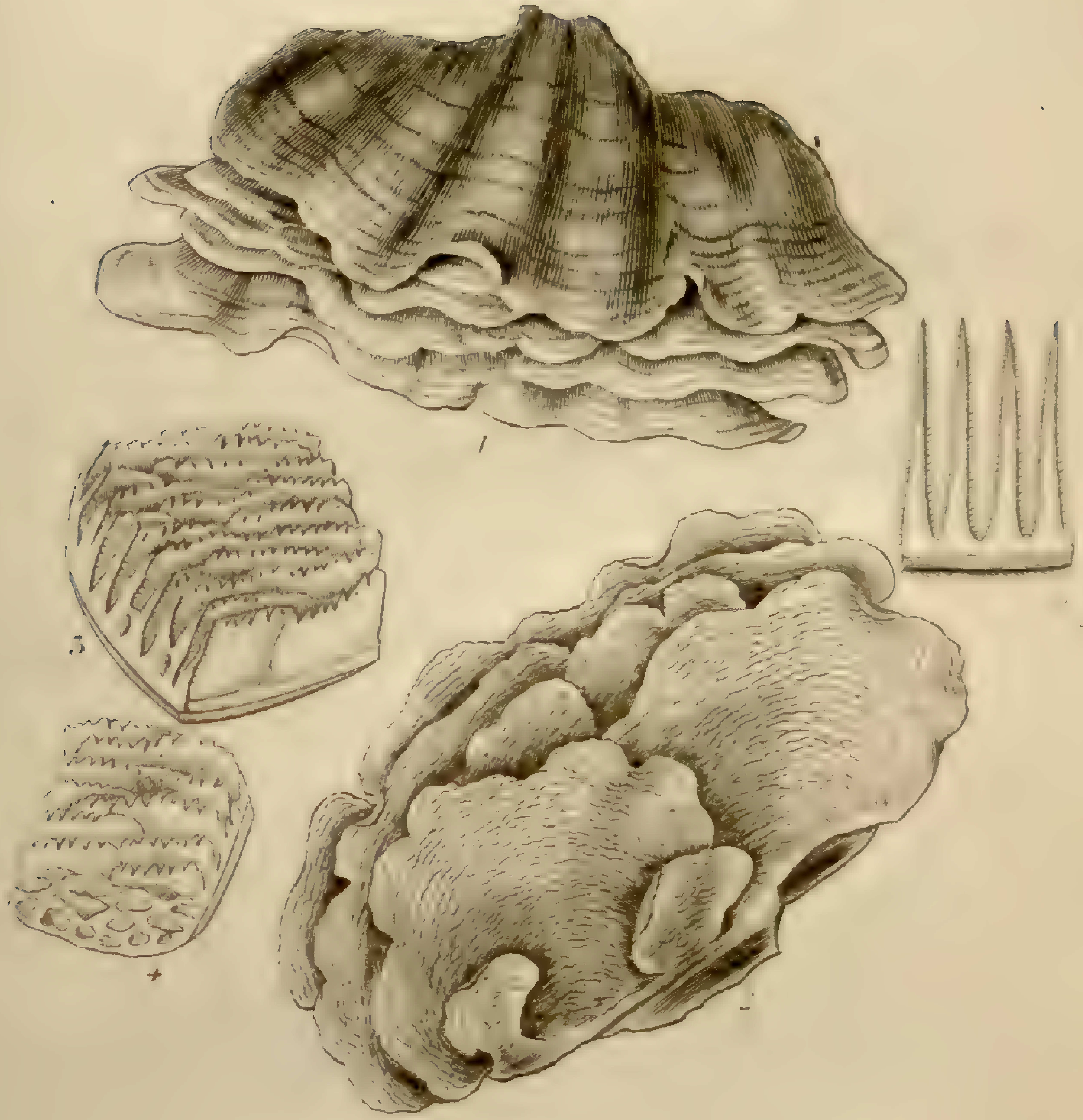
Spathicarpa hastifolia

Swan Sc.

TAB. LXXVIII.

Jungermannia Berteroana Mont.

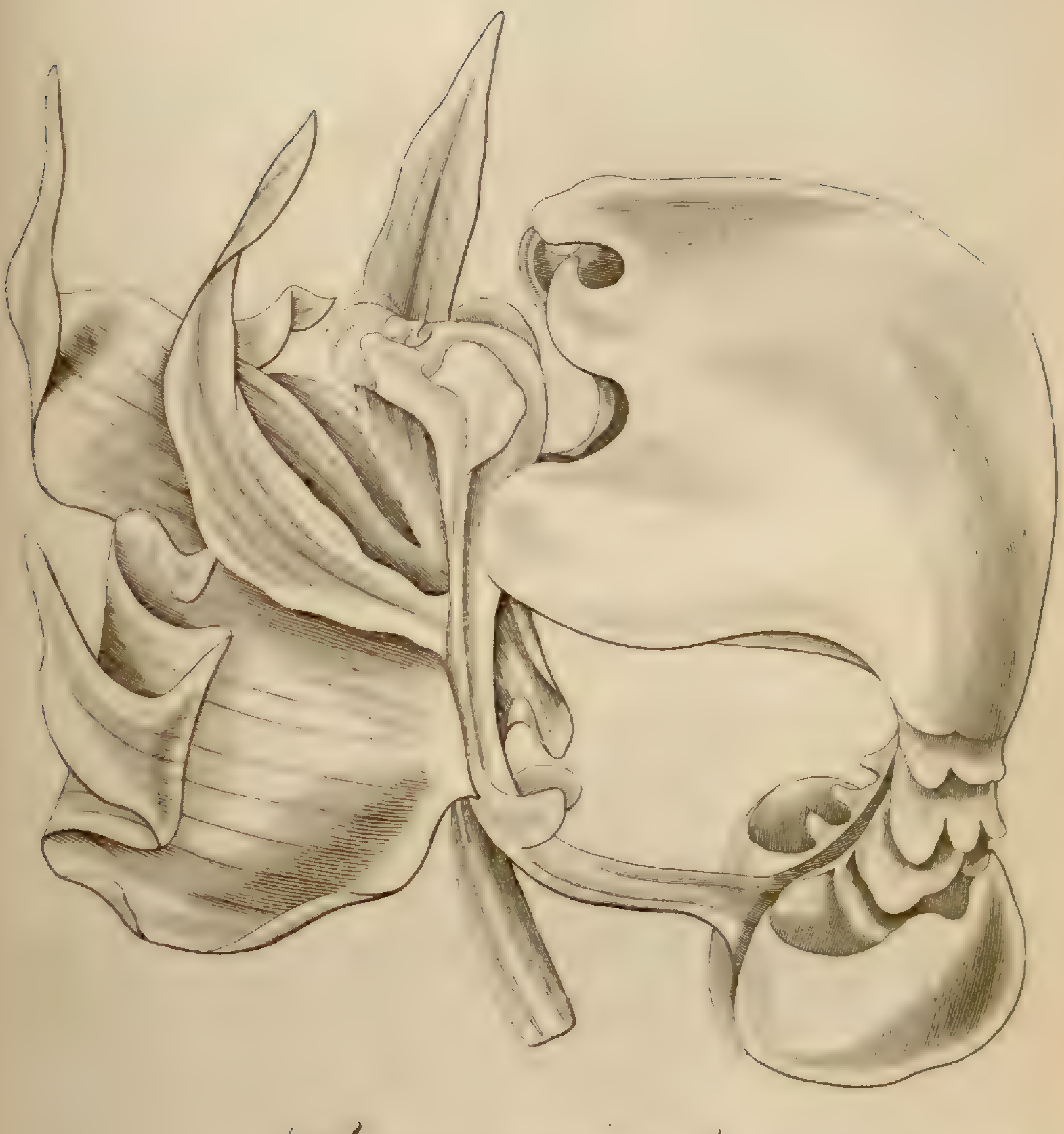
TAB. LXXIV.



W. J. H. del.t

Cyclomyces fusca.

Swan sc.



Gongora macrantha.

Telfairia pedata.

Profr Bojer delt

Figures to illustrate the method of preserving fleshy Fungi

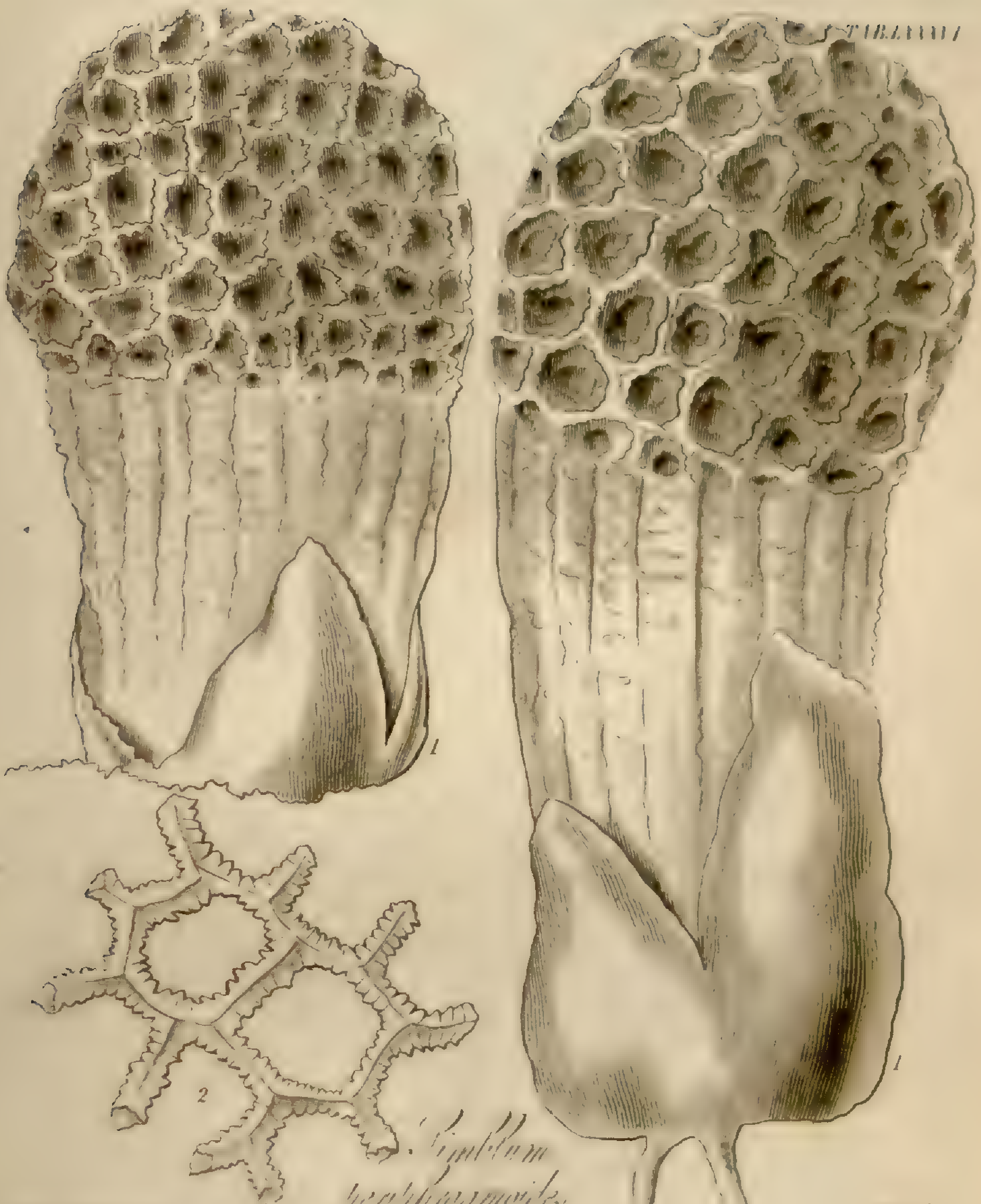
[illegible] del.t Swan Sc.

Thelephora rubra.

W. J. H del.

TAB. LXXVI.

Thelephora Kunzii.



Myonima multiflora.

Swan Sc.

Noronhea chartacea.

TAB. LXXXV

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W. J. H. del.

Cruckshanksia cistiflora.

Bauhinia grandiflora

W. J. H. del.

Bridgesia echinopsoides.

Swan Sc.

W. J. H del.

Baccharis thyoides.

Swan Sc.

Baccharis genistelloides.

W. J. H. del.

Swan Sc.

TAB: XCV.

Alstrœmeria dulcis.

W. J. H. del.^t Swan Sc.